Installation & Maintenance Data	IM 938-4
	Group: **PTAC**
	Part Number: **910116723**
	Date: **October 2013**

Applied Packaged Terminal Air Conditioner

16" x 42" PDAN with Top-Mounted Hydronic Heat with R-410A Refrigerant

Note: *Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations and are experienced with this type of equipment. Caution: Sharp edges and coil surfaces are potential injury hazards.*

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Contents

Safety Information **3**

Inspection **3**

Daikin Model PDAN Product Nomenclature **4**

Introduction **5**

Dimensional Data **6**

Wall Opening Requirements **7**

Installing Louver Frame **7**

Installing Wall Sleeve Extension **7**
- Wall Construction Types 8

Installing Wall Sleeve **8**
- Thin Wall Construction 8

Installing Wall Sleeve **10**
- Thin Wall Construction 10
- Thick Wall Construction 11
- Anchoring The Wall Sleeve 12

Installing Louvers **12**

Electrical Service **12**

Installing Cooling Chassis **12**

Installing Heat Section **13**

Installing Room Cabinet **14**

Supply and Return Coil Arrangements **14**
- Steam 14
- Hot Water 14

Controls **15**
- Standard (Non-programmable) Digital Touchpad Control 15
- User Interface 15
- Remote Thermostat Control 15
- Operation 16
- System Select Operation Using Remote Thermostat 16

Sequence of Operation **17**
- Heat Mode 18
- Standard or Programmable Digital Touchpad (LUI) Control Set-Up – Mode Selection 18

Thermistor Error Codes and Conditions **19**

Unit Protective Logic **20**

Room Freeze Protection **20**

Electrical Service Considerations **20**
- Electric Heat Unit 20

Equipment Start-up **21**

PTAC/PTHP Startup Report–Audit **22**

..... **22**

Premium (Programmable) Digital Touchpad Control Features **23**
- User Interface 23
- Premium, Programmable Digital Touchpad with Automatic Changeover from Cooling to Heating & Heating to Cooling 23

Premium (Programmable) Digital Touchpad Control **24**
- Clock Set Menu 24
- Configuration 24
- Program Time Periods 25

Remote Wall Mounted Thermostats **26**
- Non-Programmable Thermostat Specs 26
- Wall-Mounted, 7, 5-2 & 5-1-1 ProgrammableThermostat Specs 27
- Standard Auto or Manual-Changeover Two-Stage Heat/ Two-Stage Cool Specs 27
- Optional Remote Sensor 27

Wireless Remote Control (Optional) **28**

T9000 Wireless Temperature Control **28**
- Remote Control Node (RCN) 28
- Remote Mounted Thermostat Control Considerations ... 29

Premium (Programmable) Digital Control Board – Jumper Placement **30**

Standard (Non-Programmable) Digital Control Board – Jumper Placement **31**

Digital Control Board with Standby Power – Wiring Diagram **32**

Digital Control Board without Standby Power – Wiring Diagram **33**

Maintenance (Scheduled) **34**
- Equipment Protection from the Environment 34
- Recommended Spare Parts 35
- Refrigeration Cycle 35
- Fault and Protection Codes for Applied PTAC/PTHP Control Board 36
- Solid State Digital Controls – Local User Interface Display Codes 37

Troubleshooting **38**

Safety Information

Follow all safety codes. Wear safety glasses and work gloves. **Use a quenching cloth for brazing operations.** Have a fire extinguisher available. Follow all warnings and cautions in these instructions and attached to the unit. Consult applicable local building codes and National Electrical Codes (NEC) for special requirements.

Recognize safety information. When you see a safety symbol on the unit or in these instructions, be alert to the potential for personal injury. Understand the meanings of the words DANGER, WARNING, and CAUTION. DANGER identifies the most serious hazards that will result in death or severe personal injury; WARNING means the hazards can result in death or severe personal injury; CAUTION identifies unsafe practices that can result in personal injury or product and property damage.

Improper installation, adjustment, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may result in personal injury or property damage. This product must be installed only by personnel with the training, experience, skills, and applicable licensing that makes him/her "a qualified professional HVACR installer."

⚠ WARNING

The installer must determine and follow all applicable codes and regulations. This equipment presents hazards of electricity, rotating parts, sharp edges, heat and weight. Failure to read and follow these instructions can result in property damage, severe personal injury or death. This equipment must be installed by experienced, trained personnel only.

⚠ DANGER

Hazardous Voltage!
Disconnect all electric power including remote disconnects before servicing. Failure to disconnect power before servcing can cause severe personal injury or death.

⚠ CAUTION

Use copper conductors only. Unit terminals are not designed to accept other types of conductors. Failure to do so can damage equipment.

Inspection

When the equipment is received all items should be carefully checked against the bill of lading to be sure all crates and cartons have been received. All units should be carefully inspected for damage when received. If any damage is noticed, the carrier should make the proper notation on the delivery receipt acknowledging the damage. The carrier should also fill out a carrier Inspection Report. The Daikin Traffic Department should then be contacted. The unit nameplate should be checked to make sure the voltage agrees with the power supply available.

Each conditioner consists of the following components:

1. Cooling Chassis – Shipped separate in a single carton.
2. Wall Sleeve – Shipped separate in a single carton or multi-pack of 15.
3. Hydronic Heat Section – Shipped separate in a single carton.
4. Outdoor Louver – Shipped separate in a single carton.
5. Room Cabinet – Shipped separate in a single carton with kickplate attached.

IMPORTANT

This product was carefully packed and thoroughly inspected before leaving the factory. Responsibility for its safe delivery was assumed by the carrier upon acceptance of the shipment. Claims for loss or damage sustained in transit must therefore be made upon the carrier, as follows:

VISIBLE LOSS OR DAMAGE

Any external evidence of loss or damage must be noted on the freight bill or carrier's receipt, and signed by the carrier's agent. Failure to adequately describe such external evidence of loss or damage may result in the carrier's refusal to honor a damage claim. The form required to file such a claim will be supplied by the carrier.

CONCEALED LOSS OR DAMAGE

Concealed loss or damage means loss or damage which does not become apparent until the product has been unpacked. The contents may be damaged in transit due to rough handling even though the carton may not show external damages. When the damage is discovered upon unpacking, make a written request for inspection by the carrier's agent within fifteen (15) days of the delivery date. File a claim with the carrier since such damage is the carrier's responsibility.

Now that you have made an investment in modern, efficient Daikin equipment, its care and operation should be a high priority. For training information on all Daikin HVAC products, please visit us at www.daikinmcquay.com and click on Training or phone 540-248-0711 and ask for the Training Department.

Daikin Model PDAN Product Nomenclature

Note: *For Illustration purposes only. Not all options available with all models.*

P DAN 3 009 E D M H A B A M S A E

Unit Type
P = PTAC

Product Identifier
PDAN = Air Conditioner

Design Series
1 = A Design 1
2 = B Design 2
3 = C Design 3
4 = D Design 4
5 = E Design 5

Unit Size
007 = 7,000
009 = 9,000
012 = 12,000
015 = 15,000
017 = 17,000 (Cooling Only)

Voltage
A = 115-60-1
E = 208/230-60-1
J = 265/277-60-1
P = 208/230-60-1 w/standby 115-60-1
R = 265-60-1 w/standby 115-60-1
T = 208-60-1 w/standby 208-60-1

Brand Name
D = Daikin

Refrigerant
M = R-410A

Heating Type
E = Electric Heat
H = Hydronic
A = Hydronic w/Intermediate Electric

Electric Heat
A = 2.5 Kw
B = 3.5 Kw
C = 5.0 Kw
Y = None

Hydronic Heat Type
T = Steam Top Mount (Normally Closed)
H = Hot Water Top Mount (Normally Open)
Y = None

Damper Type
Damper Control
A = Automatic (Required for Hydronic Heating)
A = Fresh Air Boost Fan
M = Manual
Y = No Damper

Controls
Control Board Type
PNUY = Premium, Non-Programmable, Unit Mounted
PNWY = Premium, Non-Programmable, Wall Mounted
PNRY = Premium, Non-Programmable, Infared
PPUY = Premium, Programmable Unit Mounted
PAUY = Premium, Programmable with Auto Changeover, Unit Mounted
PPWY = Premium Programmable, Wall Mounted
PPRY = Premium Programmable, Infrared

Room Interface
Cabinet Type
A = Top-Mounted Hydronic Flat top Bottom Return

Power Connection
L = Long Cord – 72" (Standard)
S - Short Cord – 30" (Optional)
Y = None

Upgrade Packages
S = Seacoast
Y = None

SKU
A = Stock
B = Build to Order

Warranty
A = Standard
E = Extended
X =Special

Introduction

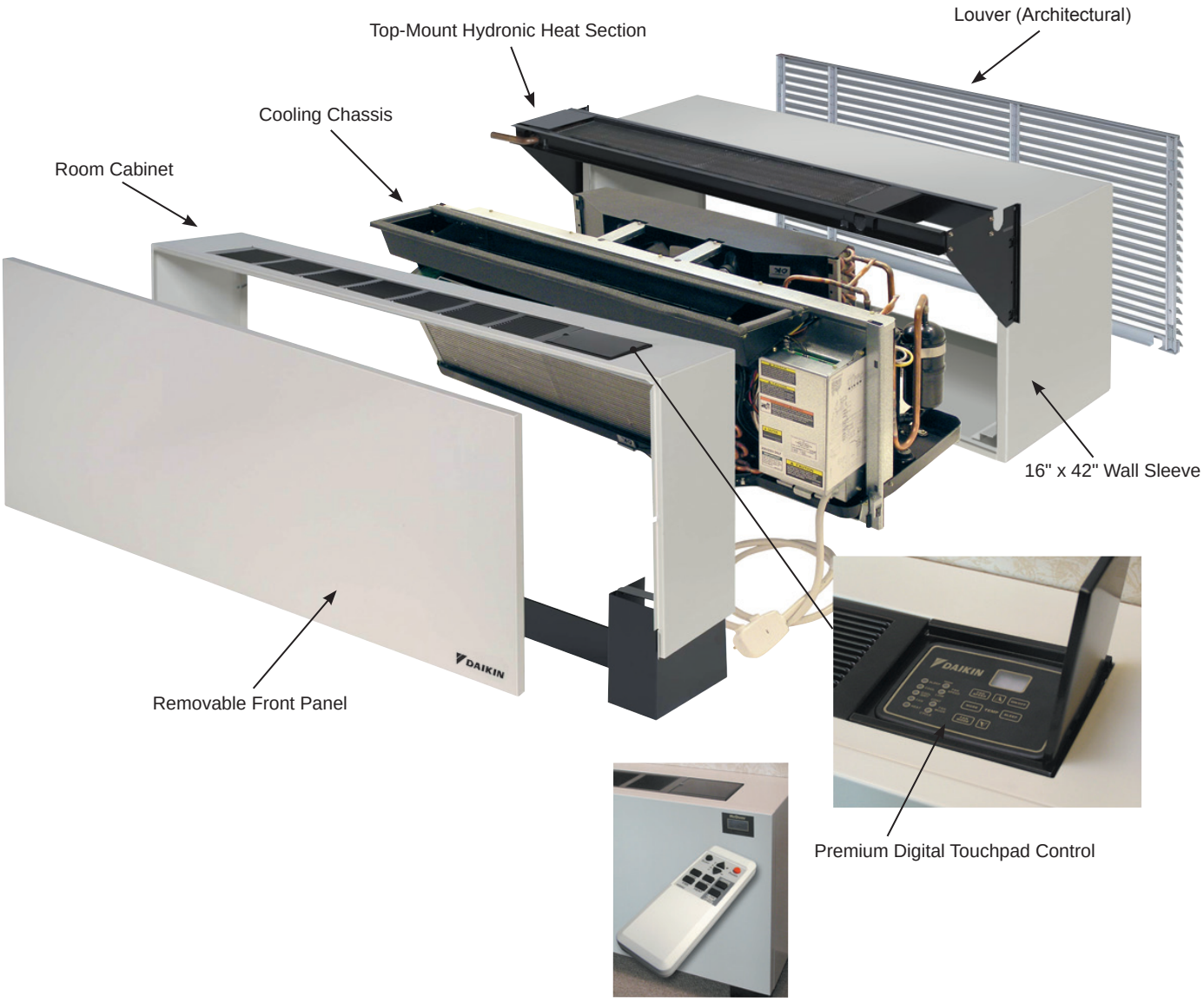
Daikin offers the most complete line of PTAC and PTHP products for new construction projects and exact replacements for our original Singer, Remington, American Air Filter and American Standard brand equipment, and models from other manufacturers.

Daikin products feature our proven institutional grade design and construction that allows you to benefit from the long life, reliability, and low sound levels, along with higher energy efficiencies for lower operating costs. Plus, Daikin offers a nationwide network for original equipment replacements with local parts and service.

Daikin Applied Packaged Terminal Air Conditioners and Heat Pumps are designed and built for through-the-wall installation in either new or existing buildings.

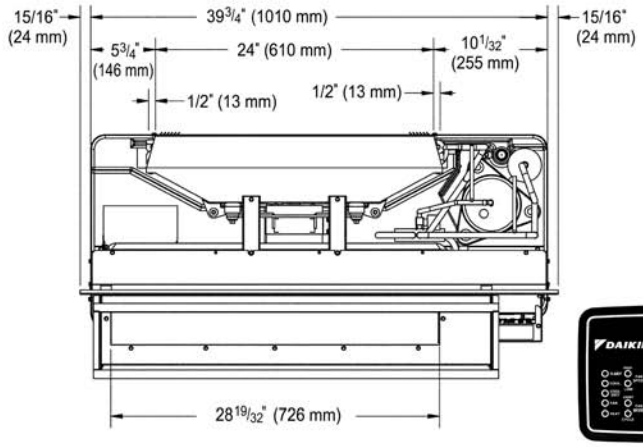
The self-contained refrigerant system delivers cooling to the desired space. Heating can be accomplished with electric resistance with hydronic (water or steam), hydronic with intermediate electric resistance or with reverse cycle technology (heat pump models only) as a special order. Generally, an estimate for capacity selection is 35 BTUH per square foot of floor space (cooling) and 4 BTUH (1.25 watts) per cubic foot (heating). The architect or engineer must verify the selection. Note that the heat pump reverse cycle generates approximately 10 BTUs per electrical watt as compared to 3.4 BTUs per watt with resistance electric heat. The unit will restart at its last setting after a power interruption.

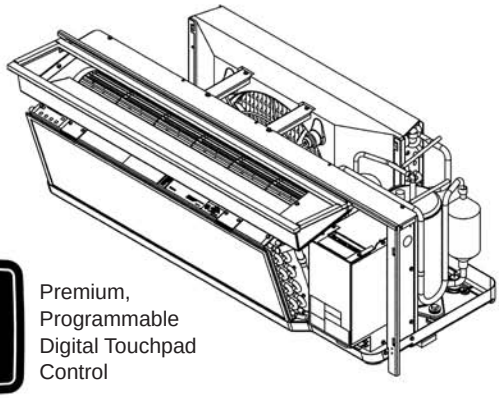
Figure 1: Exploded View of the 16" x 42" PDAN with Top-Mounted Hydronic Unit



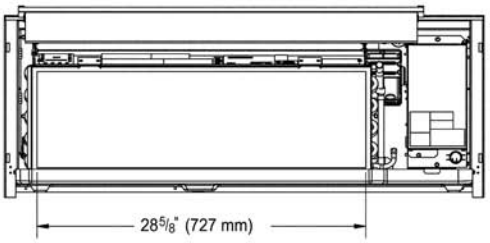
Dimensional Data

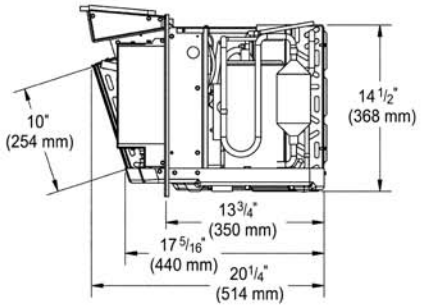
Figure 2: PDAN Chassis & Cabinet Dimensions

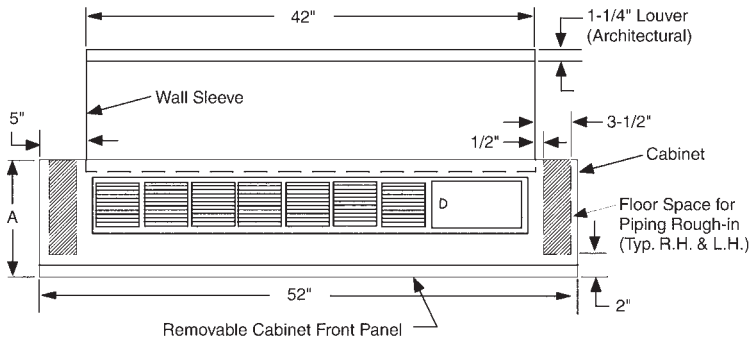




Premium, Programmable Digital Touchpad Control



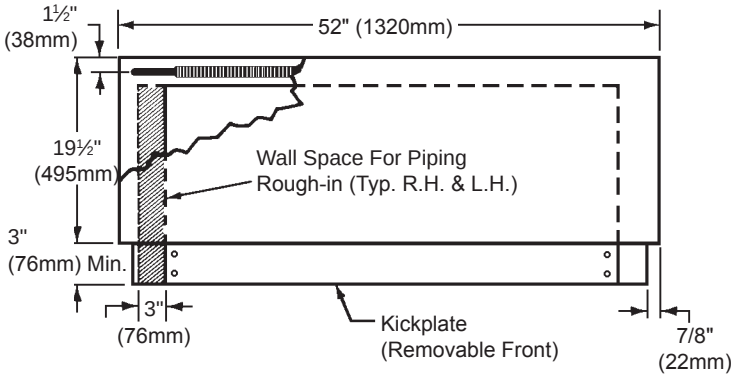


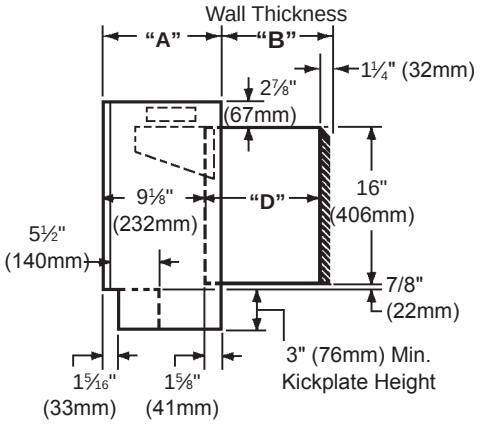


1¼" Recess for Architectural Louver		
"A" – in. (mm) Room Cabinet	"D" – in. (mm) Wall Sleeve	"B" – in. (mm) Wall Thickness
18¾ (476)	13¾ (349)	4¾ – 5¾ (121–146)
17¾ (451)	13¾ (349)	5¾ – 6¾ (146–171)
16¾ (425)	13¾ (349)	6¾ – 7¾ (171–197)
15¾ (400)	13¾ (349)	7¾ – 8¾ (197–222)
14¾ (375)	13¾ (349)	8¾ – 9¾ (222–248)
13¾ (349)	13¾ (349)	9¾ – 10¾ (248–273)
12¾ (324)	13¾ (349)	10¾ – 11¾ (273–298)
11¾ (298)	13¾ (349)	11¾ – 12¾ (298–324)
10¾ (273)	13¾ (349)	12¾ – 13¾ (324–349)
10¾ (273)	14¾ (375)	13¾ – 14¾ (349–375)
10¾ (273)	15¾ (400)	14¾ – 15¾ (375–400)
10¾ (273)	16¾ (425)	15¾ – 16¾ (400–425)
10¾ (273)	17¾ (451)	16¾ – 17¾ (425–451)

Standard Size Wall Sleeve

Note: Electrical rough-in should be located behind kickplate (removable front) and below wall sleeve.





⚠ WARNING

Residential and institutional cleaning compounds can cause permanent damage to the packaged terminal unit. To avoid damage to unit controls and heat transfer surfaces, do not spray cleaning compounds onto the discharge grille, return air opening, or unit controls. Normal cleaning can be accomplished by wiping the unit surface with a damp cloth. When using cleaning compounds on carpets, floors or walls, turn the unit off to avoid drawing potentially damaging vapors into the package terminal unit.

Wall Opening Requirements

When roughing in the opening for the wall sleeve, make certain there is sufficient clearance from the walls and floor. The wall sleeve should be positioned a minimum of 5/8" in from the room side finished wall to accommodate the room cabinet. A minimum distance of 3" above the finished floor is required for return air.

The rough opening should measure 16-1/4" high x 42-1/4" wide. Before installing the unit, check the wall opening to be sure the wall sleeve will slide into the opening unobstructed and there is allowance for a 1/8" to 1/4" pitch inside to outside for proper sleeve drainage. For masonry walls, a lintel must be used to provide support over each opening.

When using a louver frame, the opening must measure 16-5/8" x 42-5/8". Louver frames should be used for panel wall and thin wall applications to assure positive anchoring to the wall (Figure 3).

The opening must start 4" above the finished floor (including carpeting) to provide proper return air.

Installing Louver Frame

When a louver frame is used, it must be installed prior to, or at the same time, as the wall sleeve, and it must be level and square.

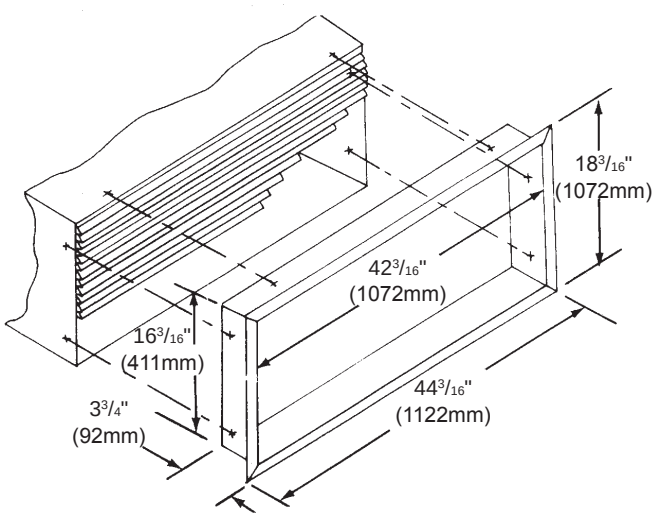
1. Apply caulking compound on the surfaces of the louver frame's four flanges which will come in contact with the wall. Add caulking as required for weather tight seal.
2. Insert the sleeve of the louver frame into the wall opening from the exterior of the building and apply firm pressure so that the caulked frame flanges are snug against the exterior of the building. Secure the louver frame to the wall if desired.
3. Secure the louver frame to the wall through the sides and top. Never secure the frame through the bottom as it may cause leaks.

If the louver frame is to be installed in a panel wall, it should be installed at the same time as the wall sleeve.

⚠ CAUTION

DO NOT drill holes in the bottom of the wall sleeve as it will cause leaks.

Figure 3: Louver Frame Dimensions



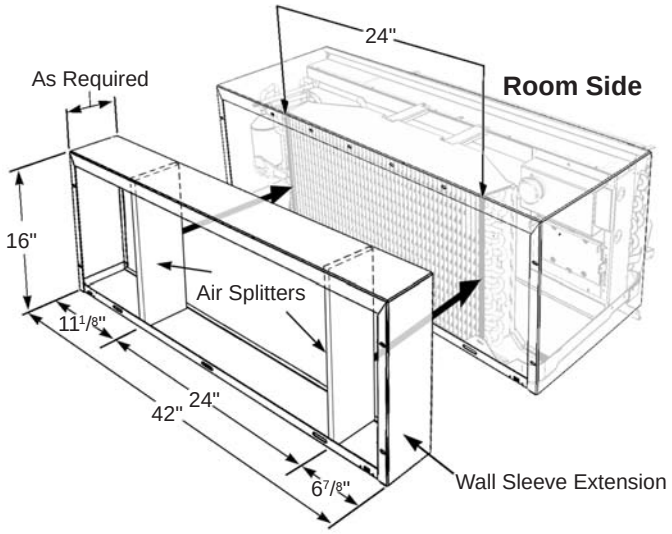
Note: *Wall Sleeve rough opening when using a Louver Frame must be 16-5/8" x 42-5/8"*

Installing Wall Sleeve Extension

Wall sleeve extensions are shipped in a separate carton and tagged to match the proper unit. Be sure to check tagging of the extension against that of the unit. Install the wall sleeve extension as follows:

1. Position the extension with standard wall sleeve so proper alignment with drain and mounting holes is achieved.
2. Place a bead of caulk around the perimeter of the wall sleeve and another bead around the mating side of the wall sleeve extension so that the joint is watertight. Do not permit caulking to block the weep holes. Be sure to use a resilient caulking such as silicone.
3. Assemble the wall sleeve extension to the wall sleeve. Clean out weep holes to assure proper drainage.
4. Continue wall sleeve installation according to instructions on page 8.

Figure 4: Wall Sleeve Extension



Wall Construction Types

Figure 5: Panel Wall (Thin) Construction

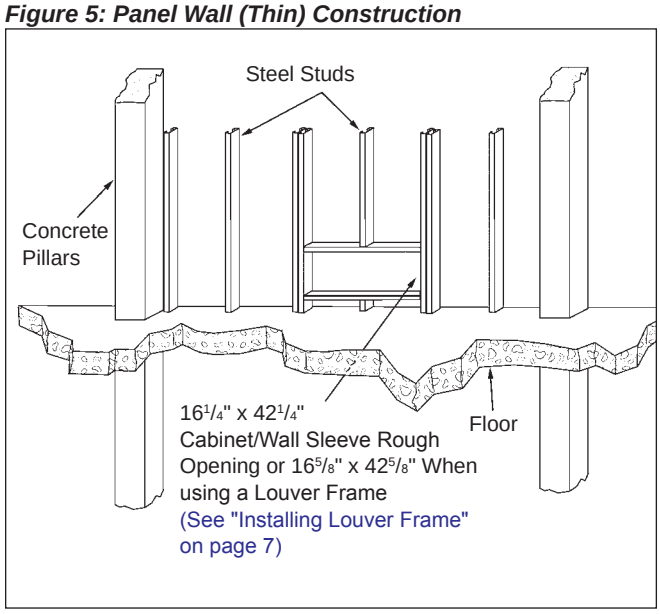

Steel Studs
Concrete Pillars
16 1/4" x 42 1/4" Cabinet/Wall Sleeve Rough Opening or 16 5/8" x 42 5/8" When using a Louver Frame
(See "Installing Louver Frame" on page 7)
Floor

Figure 6: Masonry Wall (Thick) Construction

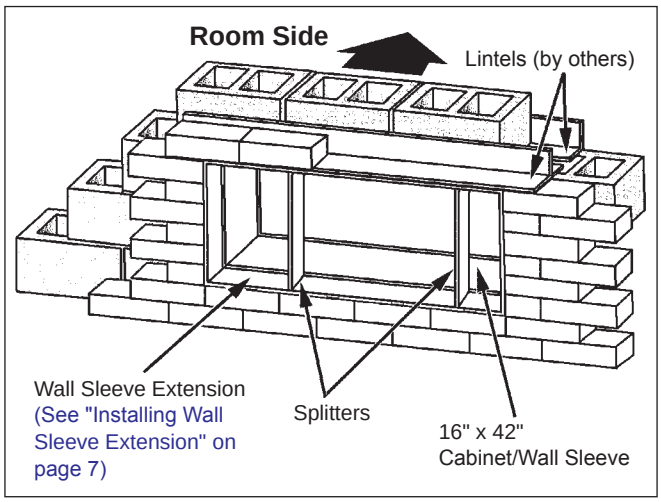
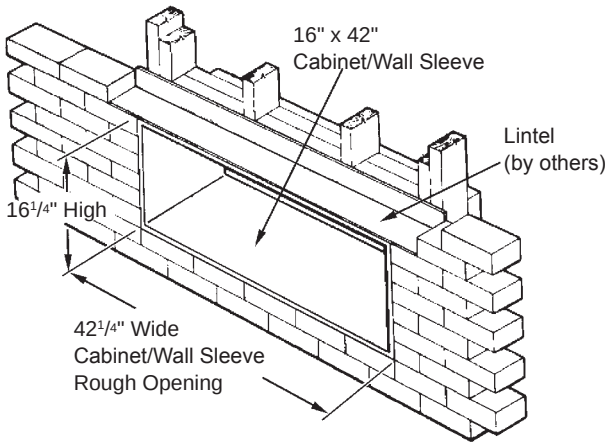


Figure 7: Frame and Brick Construction



Installing Wall Sleeve

Thin Wall Construction

The standard wall sleeve is designed to be easily installed in a variety of wall constructions. For panel wall and thin wall construction, it is recommended that the optional top angle be used and the wall sleeve be supplied with a turned down flange (see Figure 8, 9 & 10).

The recommended procedure for installing units in panel wall and thin wall construction is as follows:

1. Clean the opening of all debris that may interfere with installation.
2. Recess the wall opening so that the louver is flush with the exterior of the building. The center of gravity is approximately 10-3/4" (273mm) from the rear face of the standard wall sleeve. If a subbase is not used, field support must be provided up to the center of gravity. This support can be metal, wood or concrete.
3. Level wall sleeve side to side and pitch to outside 1/4"/ft. to assure proper sleeve drainage to outside. Anchor with appropriate fasteners. Use holes provided (see Figure 14 on page 12) or drill additional holes as required to secure firmly.

⚠ CAUTION

Do not drill holes in the base of the wall sleeve. Use shims between the wall and the wall sleeve to prevent wall sleeve distortion during anchoring.

4. Caulk the wall sleeve to the wall opening on both the inside and outside perimeter. This can be done from the inside of the building. Be careful **not** to plug the weep holes.

Note: *When using recessed louver wall sleeve, level and plumb wall sleeve using the top and sides of the sleeve and the chassis slide rails.* ***DO NOT*** *level using the bottom of the wall sleeve as it has a built in pitch to drain.*

Figure 8: 16" x 42" wall sleeve with continuous flange and drip edge

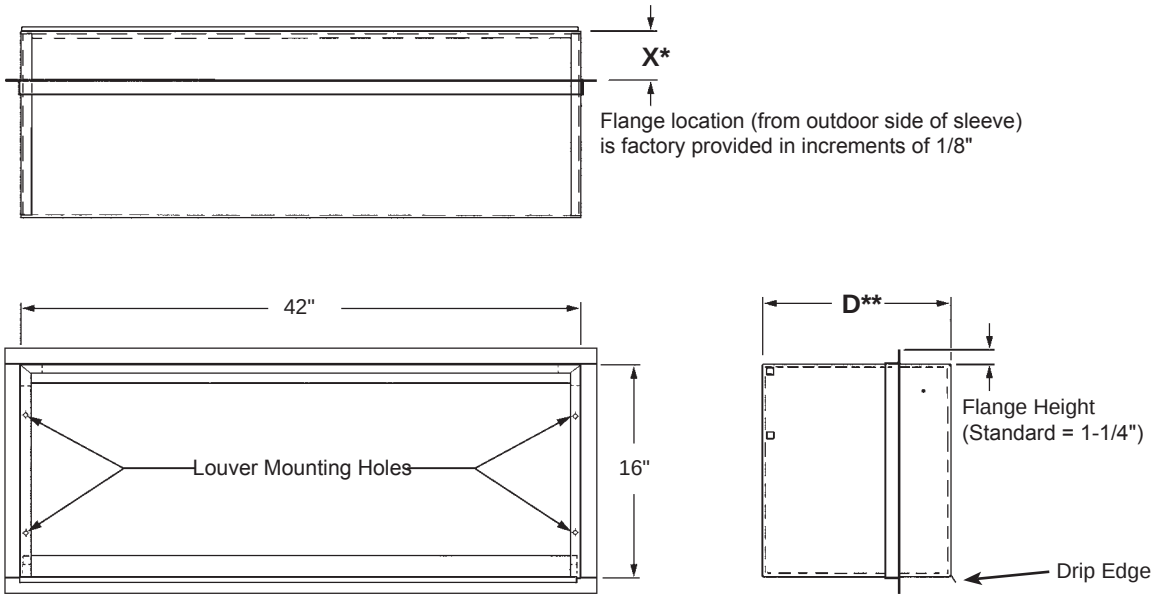


Figure 9: Wall sleeve installation for thin wall construction

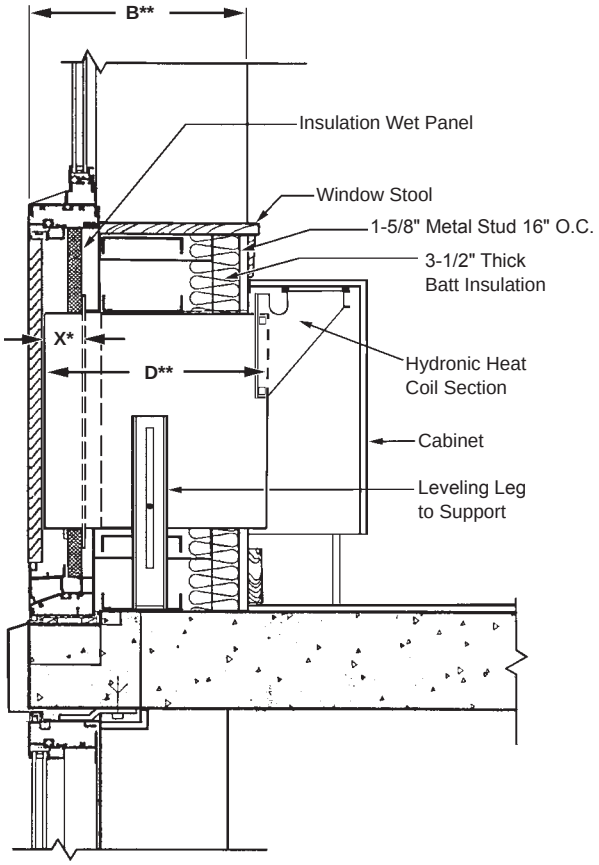
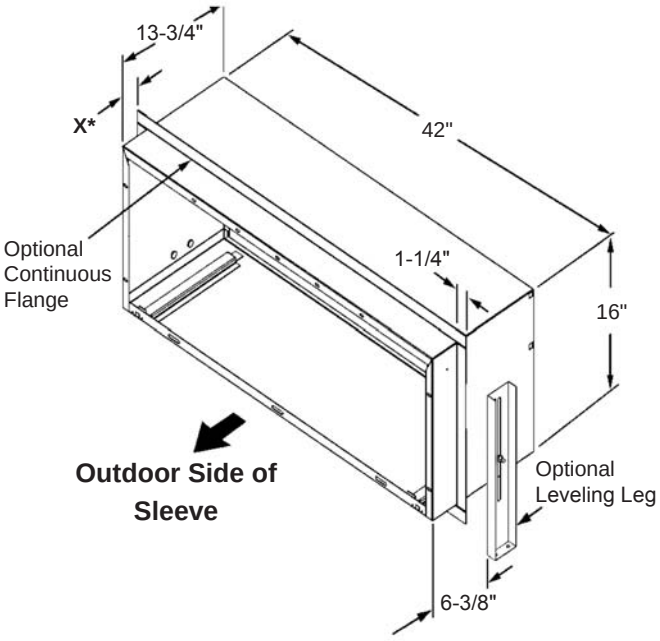


Figure 10: 16" x 42" wall sleeve with optional leveling legs and continuous flange



Note: *Given dimensions are standard.*

Notes:

** *See "PDAN Chassis & Cabinet Dimensions" on page 6, for dimensions "**D**" and "**B**".*

* *Dimension "**X**" is field determined or specified. Angle is factory welded at given dimension when option is designated.*

Installing Wall Sleeve

Thin Wall Construction

Applications utilizing field supplied louvers require additional considerations:

1. Louvers supplied by others must have 70% free area or a pressure drop not exceeding 0.05 in. w.g. (12.45 Pa) at 300 fpm (1.524 m/sec) face velocity, and a blade design that will not cause recirculation of air.
2. Daikin does not warrant the rain and water leakage resistance of its equipment when used with louvers by others.
3. All louvers by others must be approved by Daikin engineering prior to installation.

Figure 11 illustrates a typical installation using a field supplied, continuous louver. This method is for illustration purposes only. Other variations may be employed as long as they meet Daikin's louver specifications listed above and so long as adequate wall support is achieved. All structural supports and fasteners (except the optional top angle and turned down flange) are field supplied.

Installation of wall sleeves with continuous louvers is very similar to that of applications with factory furnished louvers. Assuming the louver meets the Daikin criteria, as stated previously, proceed to install the wall sleeve as follows:

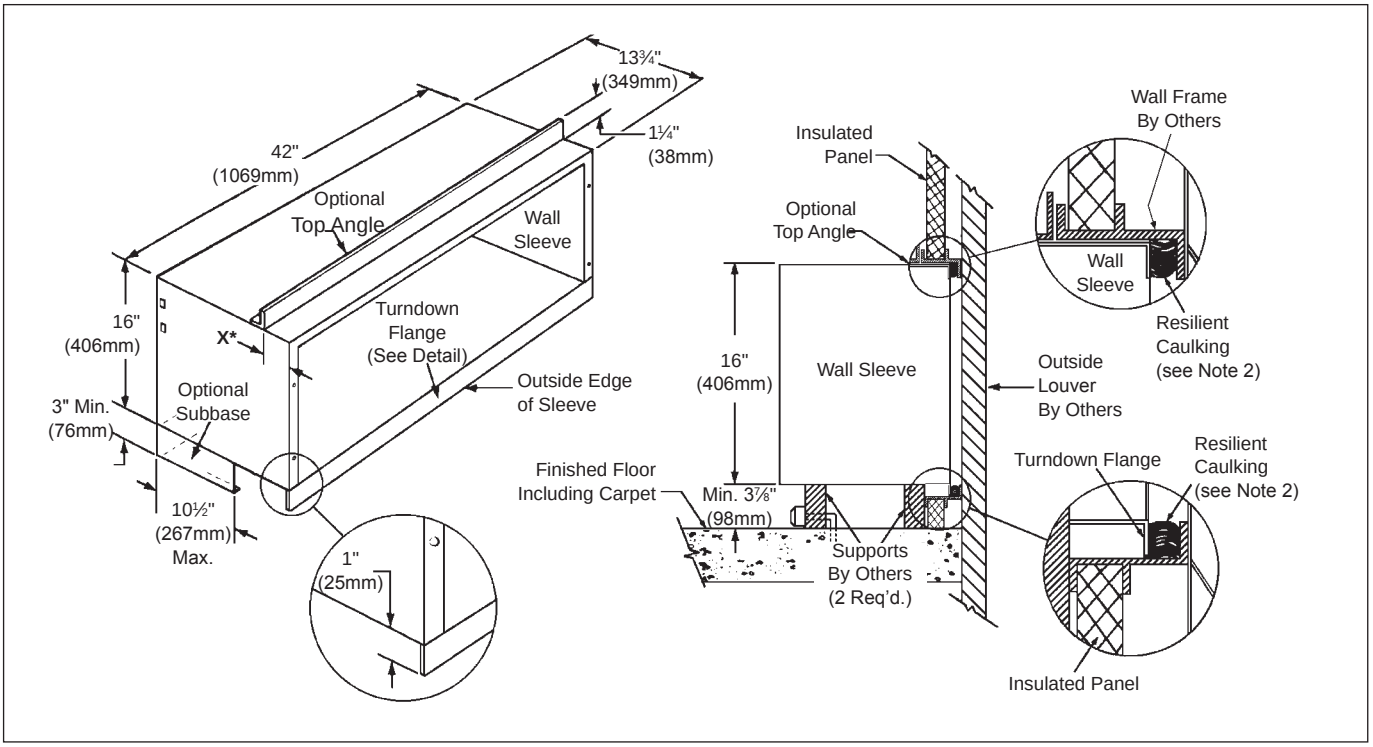
1. Clean the opening of all debris that may interfere with installation.
2. Position the wall sleeve into the wall so that it is flush with the exterior wall. Important: If the wall sleeve has been installed into a thick wall, make certain the wall sleeve protrudes into the room a minimum of 1-1/8" (29mm) beyond the finished wall surface. This is to accommodate the heat section and room cabinet. The center of gravity is 10-3/4" (273mm) from the rear face of the standard wall sleeve. If no subbase is being employed, adequate support for the wall sleeve up to the center of gravity must be provided at the job site. This support can be wood, metal or concrete.
3. Level wall sleeve side to side and pitch to outside 1/8"/ft. to assure proper sleeve drainage to outside. Anchor with appropriate fasteners using holes provided (see Figure 14 on page 12), or drill additional holes as required to secure firmly.

⚠ CAUTION

Do not drill holes in the base of the wall sleeve. Use shims between the wall and the wall sleeve to prevent wall sleeve distortion during anchoring.

4. Caulk the wall sleeve to the wall opening on both the inside and outside perimeter. This can be done from the inside of the building. Be careful not to plug the weep holes.

Figure 11: Wall sleeve installation using top angles and field supplied continuous louver



Notes: *1. Caulk entire perimeter of wall sleeve after installation.*

2. Seal area between louver and wall sleeve to prevent condenser air recirculation.

3. Dimensions shown in table on page 6 do not apply to this application.

** Dimension "X" is field determined or specified. Angle is factory welded at given dimension when option is designated.*

Thick Wall Construction

A heavy-gauge, corrosion resistant wall sleeve is provided for each unit. The wall sleeve is either shipped in a separate carton or shipped in a multi-pack of 15.

Typical installation for masonry walls is shown in Figure 12. The recommended installation procedure for this type of construction is as follows:

1. Clean the opening of all debris that may interfere with installation.
2. Be sure the unit's center of gravity falls within the load bearing surface of the wall. The center of gravity for the unit is approximately 10-3⁄4" (273mm) from the rear edge of the wall sleeve. If the center of gravity is not within the load bearing surface, then additional support such as wood, metal or concrete must be provided in the field.
3. Place a thin pad of soft mortar on the bottom of the opening. Important: Make certain the wall sleeve protrudes into the room a minimum of 1-1⁄8" (29mm) beyond the finished wall surface to accommodate the heat section and room cabinet. Be sure to recess the wall sleeve enough to accommodate outside louver. This recess is 3/8" (9.5mm) for stamped louvers and 1-1⁄4" (32mm) for architectural louvers. The louver should be flush to exterior surface when completed.
4. If a brickstop is employed (as shown in Figure 13), slide the wall sleeve into the wall until the brickstop contacts the exterior bricks, as illustrated below. If a brickstop is not used, slide the wall sleeve in the wall so that it extends into the room a minimum of 1-1⁄8" (29mm) beyond the finished interior wall surface. This allows room to attach the heat section and room cabinet. The wall sleeve should also be recessed enough to accommodate the outside louver. Level wall sleeve side to side and pitch to outside 1/4"/ft. to assure proper sleeve drainage to outside.
5. After the mortar has dried, remove the masonry support from the wall sleeve. Note: The wall sleeve is not intended to replace the lintel.
6. Anchor with appropriate fasteners (as shown in Figure 14). A 5/16" (8mm) hole is provided on each side, 2" (51mm) down from the top and 2" (51mm) in from the rear of the wall sleeve. It may necessary to drill additional holes in the wall sleeve to firmly secure it.

⚠ CAUTION

Do not drill holes in the base of the wall sleeve. Use shims between the wall and the wall sleeve to prevent wall sleeve distortion during anchoring.

7. Caulk the wall sleeve to the wall opening on both the in-side and outside perimeter using a resilient, nonhardening caulk such as silicone. Be careful not to plug the weep holes.

Figure 12: Wall sleeve installation using brickstops

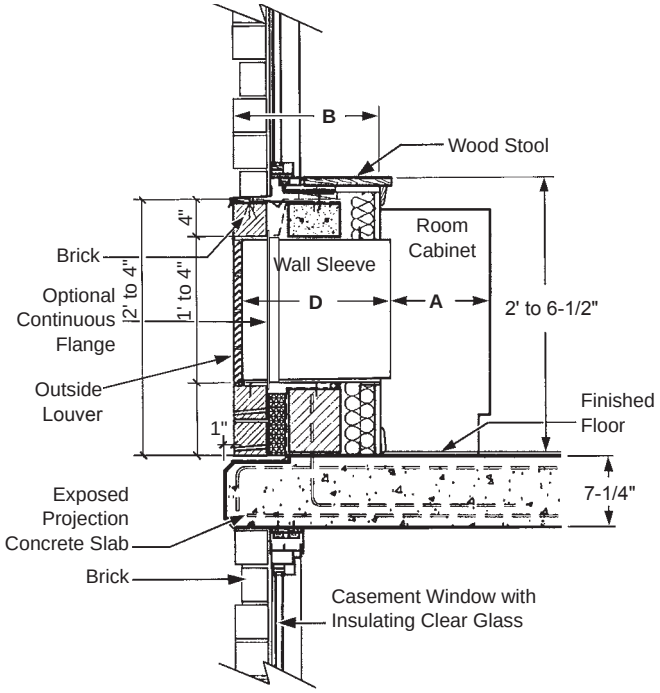
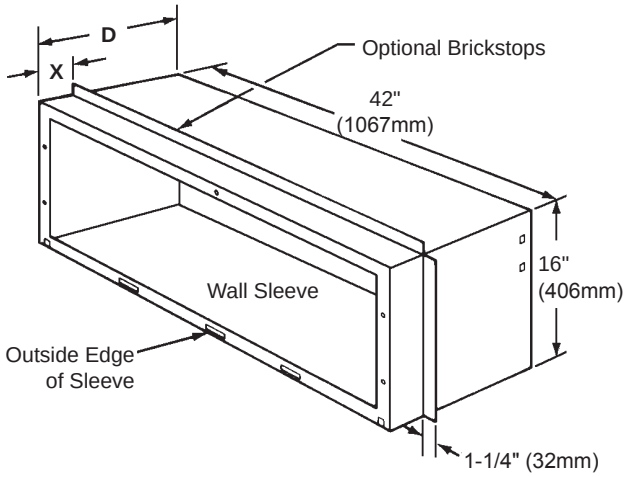


Figure 13: Standard 16" x 42" wall sleeve with brick stop



Notes: *1. For dimensions **B** and **D**, see table on page 6.*

*2. Dimension "**X**" is "as required" and is usually sent to the factory to be welded during wall sleeve fabrication.*

3. Caulk entire perimeter of wall sleeve after installation.

4. Wall sleeve to extend a minimum of 1-1/4" past finished sheetrock.

5. Wall sleeve should be installed recessed 1-1/4" from face of brick so that when louver is installed it is flush with face of building.

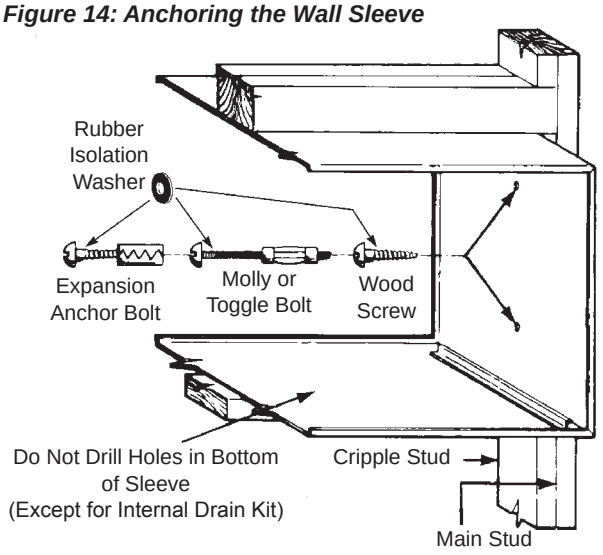
Anchoring The Wall Sleeve

Anchoring the wall sleeve is accomplished as shown in Figure 14. Use the rubber isolation washers with the fasteners to minimize sound transmission from the equipment to the wall, at the point of contact. A 5⁄16" (8mm) hole is provided on each side, 2" (51mm) down from the top and 2" (51mm) in from the rear of the wall sleeve. It may be necessary to drill additional holes in the wall sleeve to firmly secure it.

⚠ CAUTION

Do not drill holes in the base of the wall sleeve. Use shims between the wall and the wall sleeve to prevent wall sleeve distortion during anchoring.

Figure 14: Anchoring the Wall Sleeve


Rubber Isolation Washer
Expansion Anchor Bolt
Molly or Toggle Bolt
Wood Screw
Do Not Drill Holes in Bottom of Sleeve (Except for Internal Drain Kit)
Cripple Stud
Main Stud

***Note:** all anchoring hardware field supplied*

Installing Louvers

1. Remove louver from its shipping carton and also the hardware package for mounting the louver.
2. Remove outside weather plug and weather panel from wall sleeve.
3. Make a temporary handle by looping a piece of flexible wire or heavy cord through the louver. This enables the installer to keep a firm grasp on the louver when installing from inside the room.
4. Push the louver through the opening at the rear of the wall box, then pull the louver back to the wall sleeve flange so that the louver studs pass through the holes in the flange.
5. Attach washers and nuts and secure louver in place.
6. If the cooling chassis is not to be immediately installed, replace the weather panel.

IMPORTANT

Air flow required for PTAC units must not be restricted by exterior plants or walls. Plants or shrubs must not be planted in close proximity to the outside grille of the PTAC unit. Vegetation planted too close to grilles will cause discharge air to be recirculated, thereby increasing electrical consumption. Warranty will be voided if it is determined that the compressor life is shortened from overheating due to close proximity of outside obstructions.

***Note:** Discharge air restrictions include, but are not limited to:*

- Vegetation
- Concrete walls or barriers
- Overhangs that do not allow discharge air to rise
- Installation of bug screen of any kind
- Outdoor louvers by others unless approved by the factory

⚠ WARNING

Improper electrical supply can cause property damage, severe personal injury or death.

Electrical Service

All wiring should be in accordance with all local and National Electrical Code requirements.

Units are supplied with an attachment cord and plug which exit from the bottom of the conditioner on the control side. The cord for 115V, 208V and 230V has a usable length of 66" (1676mm) from where it exits the conditioner. The use of extension cords to increase the length of the plug/cord set is not recommended.

The attachment plug size should be used to determine the circuit ampacity and overcurrent protection. Time delay, overcurrent protection devices are recommended to prevent unit damage and to avoid nuisance tripping.

Outlets are generally located beneath the conditioner, on or recessed in the wall so it is concealed by the conditioner overhang and kickplate.

Installing Cooling Chassis

Correct installation of the cooling chassis is extremely important to insure the proper operation of the unit. Install the chassis as follows:

1. Remove outer carton and inspect for any shipping damage. Report any found to the carrier.
2. Check nameplate data on chassis to insure that the correct job site distribution has been made with respect to cooling capacities. Generally, corner rooms require larger capacities.
3. Remove chassis from carton by pulling evenly on substantial portion of unit.

⚠ CAUTION

Do not pull on evaporator fan housing, control box or compressor. Do not lift by pulling on the tubing. Tubing can crack or bend damaging the unit.

4. If wall sleeve has been previously installed, remove temporary weather panel.
5. Check all fasteners to make certain they have not come loose during shipment. Do not loosen bolts holding down compressor; they are set at the factory.
6. Do not lubricate motors before start-up. Motors are permanently lubricated.
7. Place Tinnerman clips from bag onto wall sleeve. Clips and mounting screws are enclosed in a bag attached to the top of the condenser coil housing.
8. If louver has not been previously installed, connect to wall sleeve as described above.
9. If louver is supplied by others, as illustrated in Figure 11, be sure to install foam type gaskets on all sides of the condenser coil to prevent recirculation or bypass of condenser air.
10. Slide chassis into wall sleeve until firmly seated against weather seals of wall sleeve. Caution: Do not push on coil surface or control box cover. Make sure the compressor tubing does not catch when inserting chassis.
11. Secure chassis to wall sleeve with four (4) sheet metal screws packaged with the Tinnerman clips.
12. Plug electrical cord into receptacle. Excess cord should be coiled up neatly and stored in the conditioner.
13. Set the manual damper operator in open or closed position as desired. On units equipped with the optional electric fresh air damper, set for “AU” or "CL" in the Configuration Mode. In “AU,” the damper is open whenever the indoor fan motor is running (AU is Auto and CL is Closed). Consult "Maintenance (Scheduled)" on page 34 for lubrication instructions.
14. Set the indoor fan mode for off cycle on the PC board for the off cycle selection of 10, 20, 30 minutes or 1 hour off cycle time. The fan will operate for 2 minutes and shut down for the selected off cycle period. For continuous fan operation, the fan mode selection on the touchpad or remote thermostat must be set to continuous or on. When the room thermostat is in the cycle or auto mode, it will cycle the indoor fan when there is a call for heating or cooling. See wiring diagrams on page 29, page 30 & page 31 for jumper placement details.
15. Set the temperature limiting feature to the desired range of thermostat operations. As shipped, the range is 60°F to 85°F.
16. Replace the air filter and front panel.
17. Connect the low voltage valve wires with theMolex connection to the valve.

Installing Heat Section

The heat section is designed to be “snapped” into the top of the wall sleeve (Figure 15). There are four square holes provided in the wall sleeve, two on each side, for coil attachment. To Assemble the heat section to the wall sleeve:

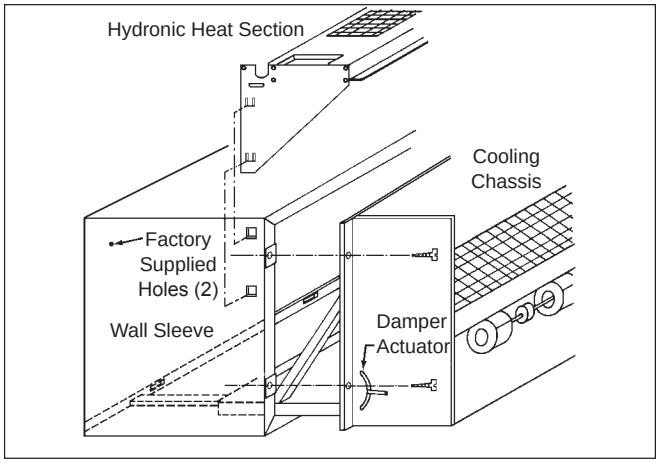
1. Unpack the heat section and inspect for any shipping damage. Report any damage found to the carrier.
2. Check the heat section against the plans to make certain the coil supplied has the connections match the specifcations.
3. Firmly attach the heat section to the wall sleeve by lining up the heat section hooks with the square holes supplied in the wall sleeve. Snap the heat section in place by exerting pressure downward.
4. The valve is always connected to the supply side of the coil. There are seven possible coil arrangements available. Each is shown on the next page. Select the illustration below that matches the coil supplied and pipe it according to the illustration. Install valve and other accessories including air vents, steam traps, stop balance valves, etc., as specified by the design engineer.
5. For valve installed on right side of the unit, make electrical connection to matching cap extending from the control box. For left side valve, make electrical connection to cap mounted to left side of chassis.

Note: *1. When the heating medium is steam, the supply connection should be attached to the uppermost tube and the return to the lower tube. The coil is pitched in the casing to allow drainage of condensate.*

2. When the heating medium is hot water, the supply connection should be made to the lowermost tube and the return to the uppermost tube. Hot water coils should be “flooded” to minimize air entrapment.

6. The Heat Fan Lockout (HFLO) must be installed on the return piping of the hot water coil and after the steam trap for steam heat units. The Factory provides a sensor snap-on bracket that will fit standard 5/8" OD copper. Sensor mounting brackets for all other pipe sizes or materials must be field supplied.

Figure 15: Installing the Cooling Chassis and Hydronic Heat Section

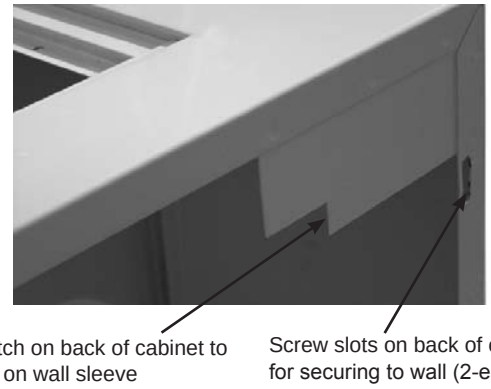


Installing Room Cabinet

The room cabinet is the last piece to install. The following instructions assume all components (wall sleeve, heat section, louver and chassis) have been installed, piped and anchored. All major room construction should also be complete so as not to damage the room cabinet after it has been installed. Attaching the room cabinet can be completed as follows:

1. Firmly grasp the room cabinet and lift it over the heat section. There are notches in the back flanges of the room cabinet that rest on the wall sleeve to assure it is centered.
2. Align the notches of the room cabinet on the wall sleeve and firmly push the cabinet downward until it seats on the wall sleeve (see Figure 16).
3. Screw the cabinet to the wall using the screws provided. There are two (2) screw holes provided on each side located on the inner flanges of the room cabinet.
4. Loosen the four (4) wing nuts on the kickplate and adjust the kickplate the required distance to the floor.
5. Tighten the wing nuts firmly.
6. Wipe any smudges or dirt off the room cabinet using a mild cleaner and a soft cloth.

Figure 16: Room Cabinet Detail



Supply and Return Coil Arrangements

Steam

Figure 17: Left-hand supply and return

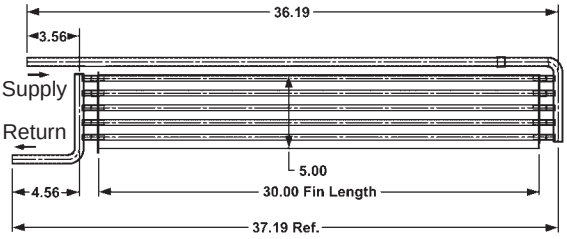


Figure 18: Right-hand supply and return

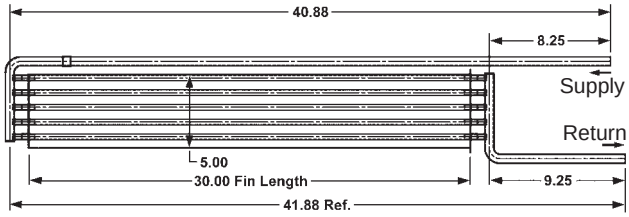


Figure 19: Right-hand supply, left-hand return

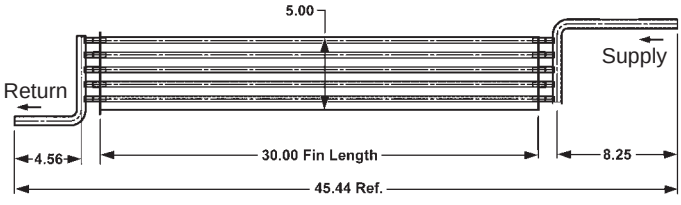
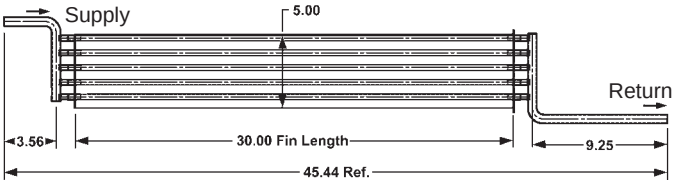


Figure 20: Left-hand supply, right-hand return



Hot Water

Figure 21: Left-hand supply and return

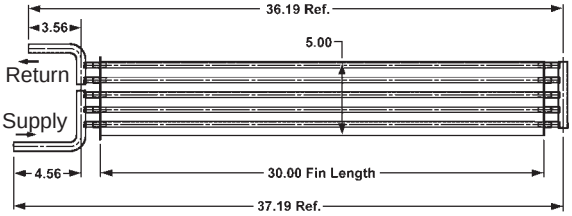


Figure 22: Right-hand supply and return

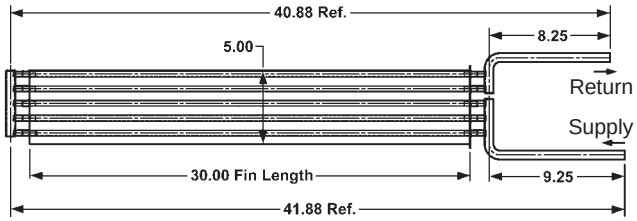
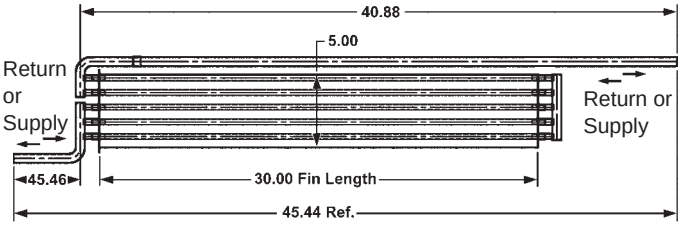


Figure 23: Left-hand supply, right-hand return or Right-hand supply, left-hand return



Controls

Standard (Non-programmable) Digital Touchpad Control

Figure 24: Standard Digital Touchpad Control Application

The PTAC Digital Control is used to control a PTAC Unit that includes both an integral air conditioner and a source of heat.

The Digital Control is operated with a Touchpad.

Inputs and Outputs

- Indoor coil sensor, (ICS)
- Outdoor coil sensor, (OCS)
- Indoor air sensor, (IAS)
- Outdoor air sensor, (OAS)
- Remote T'stat, T'STAT (RCWYBG)
- Heat Fan Lock Out (HFLO)
- Power supply, (24VAC)
- Line voltage input, (L1, L2)
- Indoor fan standby voltage, (L1STB L2STB)
- Control selection, (LUI, T'STAT
- Model selection, (AC/E, HP, HP/E)
- Time delay bypass, (TEST)
- Indoor off fan cycle, (FAN, OFF CYCLE–10, 20, 30, 1 HR)

Outputs

- Compressor output, COM
- Indoor fan, BLOWER LO, HI
- Outdoor fan, OUTDOOR FAN
- Electric heater, ELE
- Reversing valve, REV VALVE

Figure 25: Standard Digital Control Indicators

User Interface

The user will by default control the Electronic Controller via the touchpad. The user can select with a jumper for the unit to receive commands from a Remote Thermostat.

Table 1: Keys and Indicators Labels

7 Push Buttons	ON/OFF, FAN SPEED, MODE FAN MODE, SLEEP Temp buttons: ▲ for Temp UP and ▼ for Temp DOWN
9 LED Indicators	SLEEP, COOL, COOL/DRY, FAN, HEAT, HIGH, LOW, CYCLE, CONT.
LED 2 Digit Displays	No Label

Display Function Legend

Tr = Room Temperature
hI = High Room Temperature
Lo = Low Room Temperature
LA= Low Ambient Lockout
[ᵐ] = Secondary (Slave) Unit Touchpad Display - Indicates Unit is Controlled by a Master. Occurs when Slave "Control Select" Jumper is on SEC Pins
rT = Remote Thermostat Control
tP = Touchpad Control
t = Time
Ts = Temperature Setpoint
Rf = Room Freeze Condition
CF = Coil Freeze Protection
F = Fahrenheit
C = Celsius
LC = Control Lockout Mode

Remote Thermostat Control

The Remote Thermostat can be any thermostat that can interface with an electronic thermostat via RCWYBG terminals. The Control Selection jumper must be in T'STAT position. During a call the remote thermostat will pass R back to the controller on a respective terminal. The push buttons on the touchpad become inactive in the remote thermostat mode, EXCEPT in T'STAT mode, the fan speed can be changed at the Touchpad and the fan mode is dictated by the Remote t'stat. However, the control pad LED display will indicate the mode of operation, and the room temperature.

Note: *In terms of outputs, there are two types of thermostats: relay contacts and solid state. If you open the thermostat and don't see relays then it must be solid state.*

Manufacturers of solid state output thermostats include loading resistors on their installation kits. They are of 560 Ohm and 3W value. These resistors are meant to load thermostat solid state outputs in order for the output voltage to be either 0 or 24VAC, i.e. no floating voltage. These resistors are connected from W, Y, G to common (C), respectively.

You can wire any type of 24Vac thermostat straight into the REMOTE T'STAT connector of PTAC control boards, 667997102, 667997203 and 667997303 (Basic, Premium and Auto-Changeover models) and the control boards will recognize the signals from them.

Operation

Memory Recall

The digital control shall start with the last settings used prior to power down. These settings are saved in a non-volatile memory. Factory set mode is OFF.

On/Off Triggering

Control can be turned On/Off via LUI, Remote T'stat, or Sleep feature. The LUI display will show the temperature set point when the mode is Cool, Cool Dry, or Heat. The display will be blank in Fan mode.

1. **On/Off triggering with LUI**

   Control shall turn On or Off when the On/Off button is pressed in LUI. Once turned on control shall start on the last mode used before it was turned Off.

2. **On/Off triggering with the Remote T'stat**

   Control shall be turned On if it was Off from the Remote T'stat when it is set up to be controlled by a Remote T'stat. A call for heat or cool from the Remote T'stat will be used to turn the control on. Control remains on until manually turned Off.

3. **On/Off triggering with the Sleep feature**

   Sleep feature works in combination with the Timer setting. Sleep time setting shall be user adjustable from 1 to 15 hours via the Touchpad. The timer will count down and when it reaches "0" it will turn the control Off if control was previously On and vice versa, if it was Off it will turn On after time expires. As mentioned in **protections** section of this spec the Sleep operation is overridden by room freeze protection.

Control Off

When the control is in the Off Mode, relay outputs will be disabled with the exception of the indoor fan (blower). It will stay on to meet the **Hot Keep** specification. Indicator LED's are all off.

Temperature Range

The maximum operating temperature range is selectable via the Touchpad and is 60°F to 85°F with the limits included. The Remote Thermostat selectable operating range is 60°F to 90°F with limits included. The range is set in the Set-up menu.

Indoor and Outdoor Fan Operation

The indoor fan can be set to operate on High or Low speed with the Fan Speed Button on the touchpad. It can also be set for Continuous or Cycle operation on the touchpad. When set for Continuous, the "CONT" LED will be on and the fan will run continuously. When set for Cycle, the "CYCLE" LED will be on and the fan will turn on at a call for heat or cooling.

Fan Cycle Operation

On a call for Heating or Cooling, the indoor fan and the heating source or the compressor will be activated. When the call is satisfied and the heating source or the compressor is deactivated, the indoor fan will repeatedly run for 2 minutes on and the number of minutes selected on the PC Board off, until the next cut-in cycle. The number of cycles with timing as described above is determined based on the OFF FAN CYCLE jumper setting.

Remote T'Stat Mode

The unit can be jumper configured to take commands from a Remote Thermostat. The Remote Thermostat will call for Heat and Cool through the electronic controller.

1. The Remote T'stat will control through the board the work of the compressor, indoor and outdoor fans, the reversing valve, and the heater
2. System will run in Cool mode when Y signal is high. In cool mode compressor (therefore outdoor fan) shall turn on
3. Cold start feature (see Modes of Operation – Cold Start), Cool dry mode (see Cold Dry Mode) and Sleep feature (see Sleep Feature) are not available in Remote T'stat cool mode
4. In T'STAT mode, the fan speed can be changed at the Touchpad and the fan mode is dictated by the Remote t'stat.

System Select Operation Using Remote Thermostat

System will run in Heat mode and engage certain outputs based on the system selection (jumper) as described below. Also see "Figure 33: Control Wiring to Allow Primary (Master) Secondary (Slave) Unit Connection").

AC/ELE

- If AC/ELE is selected then a signal on W terminal will call for heating.

HP or HP/ELE

- If HP or HP/ELE is selected then signals on Y and B terminals will call for heating.

NOTES:

1. *Hot start and Sleep features are not available in Remote T'stat heat mode.*
2. *Control's operation is subject to its own protection features when controlled by a Remote T'stat*
3. *Indoor fan mode and the speed will default to "cycle" and "high" when unit is controlled by Remote T'stat. Fan speed may be adjusted on the LUI (Touchpad).*
4. *The indoor fan is turned on when G signal is high. When there is no signal on G terminal then the indoor fan will be turned off.*

Control Lockout Feature

The control is placed in a lockout mode of operation when Mode button is held pressed for 10 seconds. Display will show “LC” to confirm Lockout Mode has been entered. Once in this Lockout Mode the control board will not take any commands at all. In Lockout, unit will continue to operate with the same settings just prior to Lockout Mode. This means the touchpad will no longer be able to pass commands to the control. User’s set point will normally be displayed. Any button pushed will bring “LC” on display for five seconds.

To exit the Lockout Mode and return to normal (regular) mode of operation, press the Mode button for 10 seconds. Display will show “nL” for five seconds to confirm normal mode has been resumed.

Sequence of Operation

Cool Mode

In Cool Mode, the compressor will start if the temperature at the space temperature sensor is 1°F or higher than the set point. It will stop if the space temperature sensor is 2°F or lower than the set point, subject to timing requirements.

In the Cool Mode, the indoor fan will operate according to the user settings for Fan Mode – Continuous or Cycle and Speed.

Cold Start

Cold start is initiated when the control has not called for cooling for more than two (2) hours or during a power-on-reset. During cold start, the set point is lowered by 4°F (Tset-4°F) if the differential calls for cooling. The unit will operate in cold start until the new set point is satisfied (+ or – 1°F) or until the unit has run in cold start for at least 20 minutes. After one or both conditions are met, the set point will be reset to the user setting and the unit will run in the regular cool mode.

The indoor fan will operate according to the user settings for mode – Continuous or Cycle and Speed.

Cold start is not available with the **Sleep** feature.

Sleep Function

Sleep time is adjustable by the user from 1 to 15 hours in one (1) hour increments in a closed loop. The sleep time is adjusted and set via the touchpad and by pressing the Sleep Button repeatedly. On the touchpad, the display will show the set time in numbers for five (5) seconds. Before the sleep time expires, the setting can be adjusted above the number of hours passed by pressing the Sleep Button. Pressing the On/Off Button can terminate the Sleep Mode.

A changeover from Heat to Cool or another Mode will reset the Sleep Timer.

The Sleep Function will be deactivated by pressing the power-on-reset or any button (except sleep) on the touchpad or the Remote Control.

Cool Dry Mode

Select the Cool Dry Mode when the standard Cool Mode does not provide sufficient dehumidification. In Cool Dry Mode, the unit must run in Cool Mode for 12 minutes or until the temperature differential between the room temperature and the set point is less than 2°F. This will also occur after a Cold Start or a Mode change from Cool to Cool Dry. During this time the fan will operate in the Mode and Speed selected.

Until one or both of the above conditions are met, the control will determine which Dry Mode (Zone) is initiated based on the temperature differential between the room temperature (Tr) and the temperature set point (Ts):

Note: *Cool Dry is not available with Sleep Function.*

Figure 26: If Tr - Ts > 4°F, operation will be in Zone A

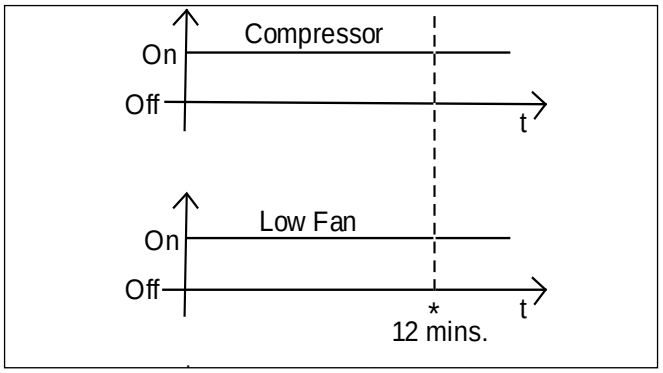


Figure 27: If 2°F < Tr - Ts < 4°F, operation will be in Zone B

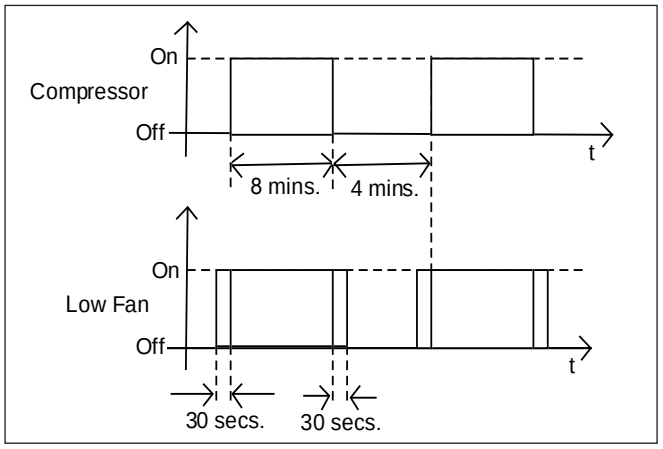


Figure 28: If 0°F < Ts - Ts < 2°F, operation will be in Zone C

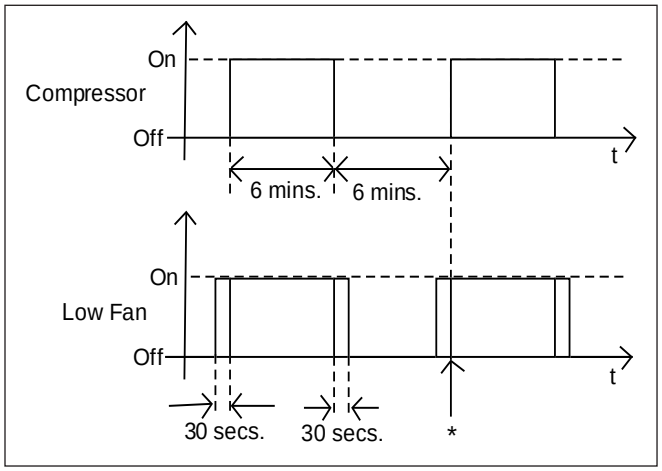
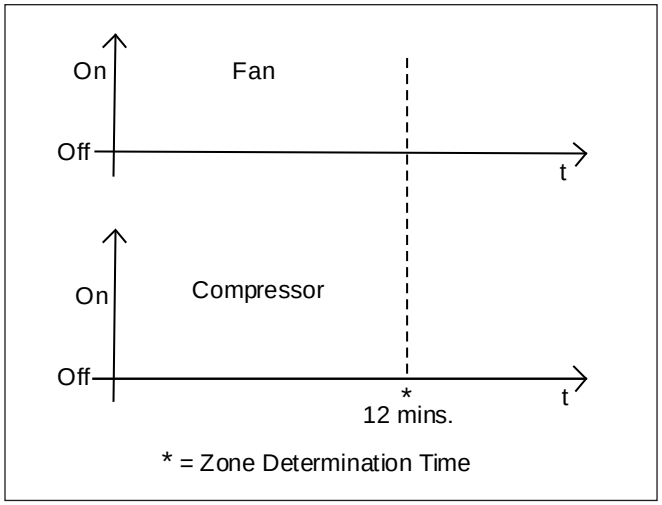


Figure 29: If Ts - Tr > 5°F, operation will be in Zone D



The other temperature ranges are dead bands for zone stability.

Heat Mode

Unit will call for heating based on the type of the heat source it has: heat pump in reverse cycle, hydronic or electric.

1) Hot Start

Hot Start is possible when the control has not called for heat in more than (2) hours or during power-on-reset. During Hot Start, the user's set point is raised 4°F (Ts + 4°F). The unit will only call for heat if room temperature differential calls for heat.

The unit will continue in Hot Start Mode until the new set point is satisfied (with a 1°F differential) or unit has run for at least 20 minutes. After one or both conditions are met, the set point will be reset to the user's setting and the unit will run in regular heat mode. Hot start is not available with the Sleep feature. The fan will operate per the Fan Mode and Speed setting.

2) Hot Keep

In Hydronic Heat: When the water valve closes, the indoor fan will operate per the user mode (Constant or Cycle) and speed setting.

Heat Fan Lock Out Control: When the unit is in the Heat Mode, but when hot water or steam is not available, it prevents the indoor fan from operating. The indoor fan will only operate in the "Fan Only" and "Cool Modes".

In Electric Heat: When the heater cuts out the indoor fan will continue to run for 15 seconds at set speed regardless of "On or Off" mode.

3) Sleep Function

Sleep time is user adjustable from 1 to 15 hours in one hour increments in a closed loop via the touch pad by pressing the Sleep button repeatedly. The **Sleep Mode can be terminated by pressing the On/Off button.**

The Sleep Function will lower the temperature setting with time. Changing the Mode or a changeover from Heat to Cool will reset the Sleep Timer.

The Sleep function will be deactivated by Power-on-reset or by pressing any button on the Touchpad except Sleep.

4) Fan Mode

In the Fan Mode, the fan will operate continuously at the user's speed setting. The compressor and outdoor fan will not operate. In single motor units, the outdoor fan will run along with the indoor fan.

Standard or Programmable Digital Touchpad (LUI) Control Set-Up – Mode Selection

To enter the Set Up Mode, simultaneously press the Up and Down buttons for 5 seconds. To change settings, press the Up or Down button. To move from one screen to another, press the Mode button.

To exit Set Up, press the Up and Down buttons simultaneously for 5 seconds or control will automatically exit Set Up in 15 seconds.

Settings within the Set Up Mode are as follows:

1) Temperature Scale Selection

Once in the Set Up Mode, the temperature scale will be displayed. To change the temperature scale to degree Celsius, press the Up or Down button. The default setting is "F", degrees Fahrenheit.

2) Temperature Limit Selection

To advance from Temperature Scale Selection to Temperature Limit Settings, press the Mode button once. To set the Cool Minimum set point, press and hold Fan Cycle button, and adjust the setting with the Up or Down buttons. **The minimum setting is 60°F.**

3) To advance from Cool Minimum Set Point to the Heat Maximum set point, press the Mode button once.

To set the Heat Maximum set point, press and hold Fan Speed button and adjust the setting with the Up or Down buttons. **Maximum setting is 85°F.**

The Display will show the upper operating limits first. The default settings are Cool min. = 60°F and Heat max. = 85°F.

4) Fresh Air Damper Control

To advance from Heat Maximum Set point, to Fresh Air Damper Control operation, press the Mode button once. Using the Up and Down buttons, toggle between "AU" for Automatic and "CL" for (forced) Closed.

The Fresh Air Damper will operate when the following conditions are met:

A. Damper setting in the touchpad set-up mode is “AU” (automatic) AND

B. Indoor fan motor turns on AND

C. Outdoor Air Sensor (OAS) temperature is greater than 40ºF but less than 90ºF AND

D. Indoor Air Sensor (IAS) temperature greater than 50ºF.

This control can be overridden by changing the damper setting in the set-up mode to “CL” (Close).

Optional Indoor Air Quality Boost Fan

The IAQ Boost Fan will operate in conjunction with the Fresh Air Damper and increase the volume of fresh air to 90 CFM. The Fresh Air Damper and Boost Fan will operate when the following conditions are met:

A. Damper setting in the touchpad set-up mode is “AU” (automatic) AND

B. Indoor fan motor turns on AND

C. Outdoor Air Sensor (OAS) temperature is greater than 40°F but less than 90°F AND

D. Indoor Air Sensor (IAS) temperature greater than 50°F.

This control can be overridden by closing the damper and turning off the Boost Fan, by changing the damper setting in the Set-up Mode to “CL” (Close).

5) Heat Pump By-Pass

to advance to Heat Pump By-Pass setting for both Basic and Premium boards, when HP/E is selected in "Control Select", use the Up and Down buttons to toggle between "Au" for Automatic or "bY" for Bypass for Heat Pump operation. Default setting is "Au"

6) Electric Heat By-Pass

To advance from Heat Pump to Electric Heat By-Pass, press the Mode button once. This screen will only appear when HP/E selection is "Au" and the outdoor coil sensor is at or above 40°F. Using the Up and Down buttons, toggle between "Au" for Automatic or "bY" for Bypass setting. In "bY" setting, electric heat is the only source of heat.

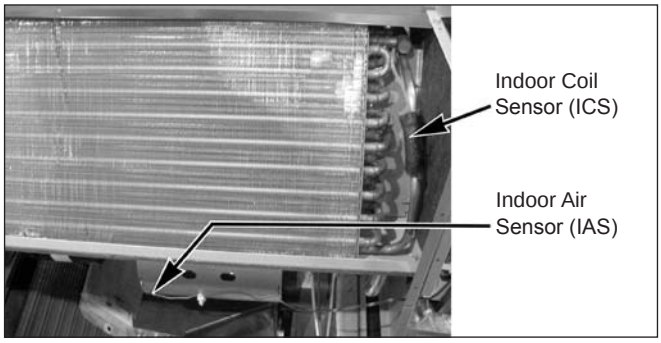
7) Indoor Air Sensor Reading

To advance from Fresh Air Damper Control, Heat pump or Electric Heat operation to Indoor Air Sensor Reading, press the Mode Button once. The display will show return air temperature.

8) Indoor Coil Sensor Reading

To advance from Indoor Air Sensor Reading to Indoor Coil Sensor Reading, press the Mode Button once. The display will show the indoor coil sensor temperature.

Figure 30: Indoor Air and Indoor Coil Sensor Locations



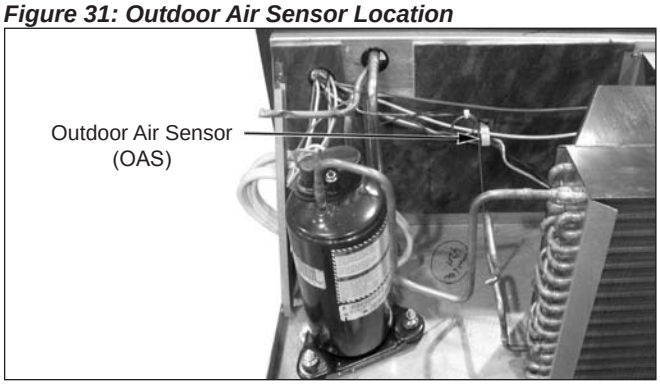
9) Outdoor Air Sensor Reading

To advance from Indoor Coil Sensor Reading to Outdoor Air Sensor Reading, press the Mode Button once. The display will show the Outdoor Air Sensor temperature.

10) Outdoor Coil Temperature Reading

To advance from Outdoor Air Sensor Reading to Outdoor Coil Temperature Reading, press the Mode Button once. The display will show the Outdoor Coil termperature.

Figure 31: Outdoor Air Sensor Location



Thermistor Error Codes and Conditions

Refer to "Fault and Protection Codes for Applied PTAC/ PTHP Control Board" on page 36.

The system treats a sensor open or short as extremely cold or hot and reacts accordingly. The exception is the room air sensor, in which case the system will turn off. When the fault is corrected by replacement or repair, the respective error code will clear from the display (See Table 2).

Table 2: Failure Code and Condition

Thermistor Sensor	Condition	Error Code
Room	< - 58°F or > 140°F or Open or Close	E1
Indoor Coil	< - 50°F for > 2s or > 176°F for > 2s or Open or Close	E2
Outdoor Air	< - 50°F for > 2s or > 176°F for > 2s or Open or Close	E4

Compressor Random Restart

When power is interrupted, a random compressor restart delay of 0 to 2 minutes is initiated. In the Cool Mode only, the compressor will start operating only after the random delay plus 3 minutes (minimum off time for thermostat, ie. 2 to 5 minutes). Random delay is used only during system startup or reset.

Unit Protective Logic

Compressor Minimum Run Time

For thermostat-controlled running cycles, the compressor will have a minimum run time of 90 seconds. The compressor can be stopped at any time if the system is switched to any Mode, except the Cool Dry Mode.

Compressor Minimum Off Time (delay on break)

When compressor is under the thermostat control, it has a 3-minute delay before restarting when it has cycled off.

Indoor Coil Freeze Protection

In Anti-Freeze Mode, the compressor and outdoor fan will be stopped and the display will show “CF”. The compressor and outdoor fan can be started only if the following conditions are met:

1. after the 3 minute delay on break, AND
2. the indoor coil reaches 49°F or above and remains there for at least 1 minute, OR
3. another Mode is selected.

The system is in Anti-Freeze Mode when the following conditions are met:

1. The control is in either Cool or Cool/Dry Mode.
2. The indoor coil reaches 32°F and stays there for at least five (5) minutes.
3. The compressor has run for at least 90 seconds.Sleep Timer is overridden during this operation.

Note: *Anti-freeze Protection is active in all modes of operation and when the control is Off.*

Room Freeze Protection

When room temperature falls below 41°F, the electric heater is controlled, or the hydronic valve is opened and the indoor fan operates on High Speed. The compressor and outdoor fan are off and the display will show “rF”. The electric heater is controlled, or hydronic valve will close when the room temperature rises back to 50°F. During room freeze conditions, the temperature setting can be adjusted with the touchpad. Fan modes and Sleep Operation are overridden during Room Freeze Protection. Room Freeze Protection is active in all modes of operation and when control is off.

Temperature Limiting

When the room temperature drops 5°F below minimum set point, the display will indicate “Lo.” When the room temperature rises 5°F above maximum set point, the display will indicate “hI.” Alarm indications of 5°F above or below set point will be consistent with the set up mode settings for minimum and maximum temperatures.

Temperature Limit Settings

1 To adjust the lower operating temperature limit (cool minimum set point) press and hold Fan Mode button and adjust the setting with Up or Down buttons. The minimum setting is 60ºF (15ºC).
2. To adjust the upper operating temperature limit (heat maximum set point) press and hold down Fan Speed button and adjust the setting with Up and Down buttons. The maximum setting is 85ºF (30ºC). When control selection is set for “T'STAT,” the maximum setting can go up to 90ºF (32ºC).
3. The upper operating temperature limit will be displayed first.
4. Default settings are: Cool minimum 60ºF (15ºC) and Heat maximum 85ºF (30ºC).

Electrical Service Considerations

All wiring should be done in accordance with all local and National Electrical Code requirements. The conditioners are supplied as follows:

Electric Heat Unit

1. 208V and 230V models are supplied with a power cord which will exit from beneath the conditioner on the control side. The cord has a usable length of 72" (457.2mm) from where it exits the conditioner. The use of an extension cord is not recommended. Time delay fuses are recommended to avoid nuisance tripping. The receptacle is generally mounted beneath the conditioner on or recessed in the wall so that it is concealed by the conditioner over hang. The space under the conditioner must be at least 3" (76mm) high.
2. An electrical subbase is available for 208V and 230V units and contains a junction box for a field-mounted receptacle All electrical connections are made within the subbase, thus eliminating the need for a wall mounted receptacle.

   The subbase is available in 3" (76mm) or 4" (102mm) height and can be furnished with factory-mounted fused disconnect option.
3. On all 265V models, an electrical subbase is required. The chassis is supplied with a “short cord” which is just long enough to plug into the subbase. A plug cord cover is also furnished with the subbase to make the interconnecting cord inaccessible as required by the National Electrical Code. The conditioner is marked with the minimum circuit ampacity and maximum fuse size.

Equipment Start-up

Initial start-up of the Incremental® conditioners by experienced personnel is usually the responsibility of the installing contractor. This start-up consist of inspecting and operating the equipment for all functions at the time of initial installation and making necessary adjustments. It also includes demonstrating its proper operation to the owner or his agent.

Note: *that unless otherwise specifically agreed to in writing, Daikin includes no field labor, start-up service or the like in the price of its equipment.*

After the equipment leaves the factory, it may become damaged or maladjusted during transportation or on the job. Sometimes wires are disconnected accidentally or fan motors move on their bases due to rough handling, causing fans to strike. The correction of such conditions is part of start-up.

⚠ CAUTION

Before starting equipment, make certain that:

1. Correct voltage has been supplied to the equipment.
2. The electrical plug from the control box has been inserted into the receptacle.

During Start-up (applies only to standard equipment):

Note: *Direction of conditioner air may be adjusted by repositioning the discharge grille(s) to change airflow pattern in a room. The building superintendent or assistant manager should be requested to make any changes.*

PTAC/PTHP Startup Report–Audit

Job Name _____ City _____G.O. # _____

Installer _____Total No. of Units_____

Date of Final Inspection and Start-up _____

Manufacturers' Representative Name _____

Unit Type

☐ APTAC 16 × 42 ☐ Type K

☐ APTAC 16 × 44 ☐ Type J

☐ Enersaver

Name of Maintenance Manager Instructed _____ Other_____

Essential Items Check

A. Voltage Check _____ Volts (measured)

B.

Yes	No	Condition	Yes	No	Condition
☐	☐	Filters Clean	☐	☐	Operates in Heating
☐	☐	Evaporator Coils/Drain Pans Clean	☐	☐	Operates in Cooling
☐	☐	Wall Boxes Sealed To Wall, No Leaks	☐	☐	Operates in Fan Only (if so equipped)
☐	☐	Wall Box Pitch Satisfactory	☐	☐	Hi-Lo Fan Speed Operational (if so equipped)
☐	☐	Air Discharge Free of Obstruction	☐	☐	Fans Rotate Freely Without Striking Fan Housing
☐	☐	Condenser Air Free of Obstruction	☐	☐	Cycle/Continuous Fan (if so equipped)
☐	☐	Other Conditions Found: _____			

_____

_____

Note: *"No"* answers above require notice to installer by memorandum (attached copy).

Please include any suggestions or comments: _____

_____

_____

_____

_____

Above System is in Proper Working Order

_____
Date

_____
Sales Representative Signature

_____
Customer Signature

FOR INTERNAL USE

Release:

SM _____

CTS _____

T_____

_____
Service Manager Approval

_____
Date

Form No. 13F-1206

Premium (Programmable) Digital Touchpad Control Features

Application

The PTAC Digital Control is used to control a PTAC Unit that includes both an integral air conditioner and a source of heat.

The Digital Control is operated with a Touchpad.

Inputs and Outputs

- Indoor coil sensor, (ICS)
- Outdoor coil sensor, (OCS)
- Indoor air sensor, (IAS)
- Outdoor air sensor, (OAS)
- Remote T'stat, T'STAT (RCWYBG)
- Heat Fan Lock Out (HFLO)
- Power supply: (24VAC)
- Line voltage input, (L1, L2)
- Indoor fan standby voltage, (L1STB L2STB)
- Control selection: (LUI, T'STAT
- Model selection: (AC/E, HP, HP/E)
- Time delay bypass, (TEST)
- Indoor off fan cycle: (FAN, OFF CYCLE–10, 20, 30, 1 HR)

Outputs

- Compressor output, COM
- Indoor fan, BLOWER LO, HI
- Outdoor fan, OUTDOOR FAN
- Electric heater, ELE
- Reversing valve, REV VALVE

User Interface

The user will by default control the Electronic Controller via the touchpad. The user can select with a jumper for the unit to receive commands from a Remote Thermostat.

Table 3: Keys and Indicators Labels

8 Push Buttons	ON/OFF, FAN SPEED, MODE, FAN MODE, SLEEP, PROG-ON/OFF Temp buttons: ▲ for Temp UP and ▼ for Temp DOWN
9 LED Indicators	SLEEP, COOL, COOL/DRY, FAN, HEAT, HIGH, LOW, CYCLE, CONT.
LED 2 Digit Displays	No Label

Display Function Legend

Tr = Room Temperature
hI = High Room Temperature
Lo = Low Room Temperature
LA = Low Ambient Lockout
[ ] = Secondary (Slave) Unit Touchpad Display - Indicates Unit is Controlled by a Master. Occurs when Slave "Control Select" Jumper is on SEC Pins
rT = Remote Thermostat Control
tP = Touchpad Control
t = Time
Ts = Temperature Setpoint
Rf = Room Freeze Condition
CF = Coil Freeze Protection
F = Fahrenheit
C = Celsius
LC = Control Lockout Mode Turned ON
nL = Control Lockout Turned OFF

Premium, Programmable Digital Touchpad with Automatic Changeover from Cooling to Heating & Heating to Cooling

Available with the Programmable LUI (668003802) and Premium Board (667997303) only. The Auto-Changeover board has a new control set with a touchpad label that shows, "AUTO". The Auto Changeover control provides:

- Auto changeover from heat to cool and vice versa
- LED's from top down that read: Sleep, Cool, Auto, Fan, and Heat

AUTO Non-Programmable Mode:

- Display shows both HEAT and COOL icons
- Temperature set point displays between the HEAT and COOL icons
- Setpoint is adjusted with Up and Down arrows
- Heating initiates when the room temperature falls one degree below the thermostat setpoint. Heating terminates when the room temperature reaches two degrees above the setpoint
- Cooling initiates when the room temperature reaches one degree above the thermostat setpoint. Cooling terminates when the room temperature falls two degrees below the setpoint

AUTO Programmable Mode:

- HEAT and COOL icons alternatively flash with their respective programmed setpoints
- The system engages cooling and heating automatically to maintain respective setpoints according to system model selection
- The 2-degree gap between setpoints represents the deadband and is necessary to prevent unecessary switching between heating and cooling

The 2 degree deadband provides the following:

- Heating activates when the room temperature is one degree below the thermostat setpoint plus the 2 degree deadband.
- Cooling activates when the room temperature is one degree above the thermostat setpoint plus the 2 degree deadband

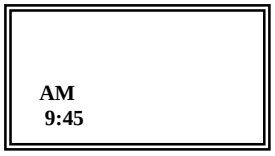
Figure 32: Keys and Indicators Labels

8 Push Buttons	ON/OFF, FAN SPEED, MODE, FAN MODE, SLEEP, PROG-ON/OFF Temp buttons: ▲ for Temp UP and ▼ for Temp DOWN
9 LED Indicators	SLEEP, COOL, AUTO, FAN, HEAT, HIGH, LOW, CYCLE, CONT.
LED 2 Digit Displays	No Label

Premium (Programmable) Digital Touchpad Control

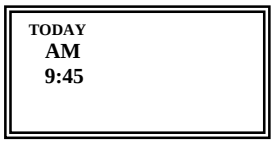
Clock Set Menu

1.1 To set the time and day of the week, press FAN MODE and FAN SPEED buttons simultaneously for 5 seconds. Time will be displayed first:



1.2 Adjust the time by pressing ▲ and ▼ buttons. By holding pressed ▲ or ▼ buttons, time will change in 15 minutes increments or decrements respectively. AM and PM will show in rotation.

1.3 By pressing **FAN MODE** button, move to the confirmation day of the week. Numbers represent days of the week, Monday being 1 and so forth. **TODAY** will flash on display. Adjust the number that represents the day of the week by pressing ▲ and ▼ buttons:

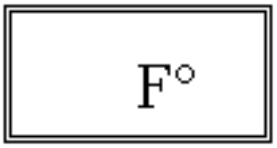


1.4 Exit the clock set menu by pressing **FAN MODE (TIME)** and **FAN SPEED (DAY)** simultaneously for 5 seconds

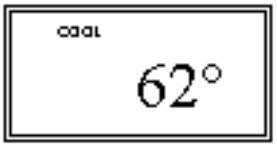
Configuration

The configuration mode is meant for temperature scale setting, limits for minimum and maximum operating temperatures and displaying sensor readings. To enter the configuration mode hold pressed ▲ and ▼ buttons for 5 seconds. Moving from one screen to another and rolling over is done by pressing Mode button.

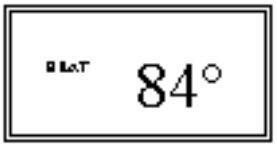
2.1 Once in the configuration mode, the default temperature scale will be displayed as shown below. Toggle the temperature scale to degree Celsius by pressing either ▲ or ▼ button:



2.2 To adjust the lower operating temperature limit (cool minimum set point) press and hold the Fan Mode button, and repeatedly press ▲ or ▼ buttons. COOL and the setting will be displayed as shown below. The minimum and factory default setting is 60°F (15°C). An example of what can be displayed:



2.3 To view the upper operating temperature limit (heat maximum set point) press MODE button. HEAT will be displayed. An example of what can be displayed:



2.4 To adjust the upper operating temperature limit (heat maximum set point) press and hold the Fan Speed button, and repeatedly press ▲ or ▼ buttons. The max and factory default setting is 85°F (30°C). When Control selection jumper on control board is set for "T'STAT," the max setting can go up to 90°F (32°C).

2.5 By pressing MODE button repeatedly from the previous screen, the following will be displayed in sequence:

- Indoor air sensor reading
- Indoor coil sensor reading
- Outdoor air sensor reading
- Outdoor coil sensor reading

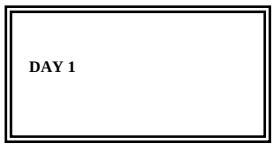
2.6 Exit the configuration mode by pressing ▲ and ▼ buttons for 5 seconds

Program Time Periods

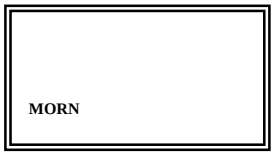
3.1 The touchpad of the electronic controller can be programmed for four time periods, **MORN, DAY, EVE**, and **NITE** that are customizable for each day of the week. Each period will have a start time, heat and cool temperatures. The unit will monitor the day and time, while maintaining the specific conditions for each period of the day. During programming, the item that is flashing is adjustable.

3.2 To enter the program menu, press **SLEEP** (▶) and **MODE** (◀) buttons for 5 seconds.

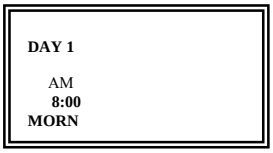
3.3 By pressing **SLEEP** (▶) display will show the day screen as shown below. Press ▲ or ▼ button to change the day to program. To advance to the next screen, press **SLEEP** (▶) button. To return to the previous screen, press **MODE** (◀) button.



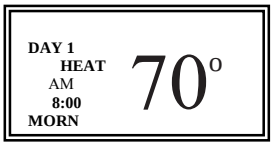
3.4 By pressing ▲ or ▼ button, the period of the day will change.



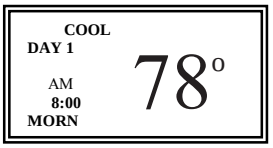
3.5 To advance to the next screen, press **SLEEP** (▶) button. Starting time will flash. Adjust the starting time by pressing ▲ or ▼ buttons.



3.6 To advance to the next screen, press **SLEEP** (▶) button. Heat temperature will be displayed. Adjust the heat setting with ▲ and ▼ buttons.



3.7 To advance to the next screen, press **SLEEP** (▶) button. Cool temperature will be displayed. Adjust the cool setting with ▲ and ▼ buttons.



3.8 To program the thermostat for each period of the day, repeat steps 3.3 through 3.7.

Further, the thermostat can be programmed for each individual day of the week or use the *Simpleset*™ feature as described below.

3.9 *Simpleset* programming is a convenient method of programming the thermostat. Once the entire Monday (Day 1) schedule is set, *Simpleset* programming will copy the Monday schedule to every day of the week. After completing Monday schedule, "day 2" will appear on the screen. Press Down button once to get to "day 1." By pressing Down button for 3 seconds, days of the week will count down from 7 to 1 and settings are memorized. Once the schedule is locked in, go through each day of the week and make changes as needed. This feature speeds up the programming of the standard weekday/weekend schedule.

3.10 To exit the program mode, press **MODE** (◀) and **SLEEP** (▶) buttons simultaneously for 5 seconds.

3.11 After exiting the program mode, select the mode of operation and activate the program mode by pressing the **PROG ON/OFF** button.

NOTICE

After a power outage, programmed daily settings will be retained in memory. However, the clock must be reset to the current time for the programmed daily settings to resume the correct schedule of operation. See Clock Set Menu instructions to reset the time and day of week.

Remote Wall Mounted Thermostats

Remote Thermostat Control

The remote thermostat can be any thermostat that can interface with an electronic thermostat via RCBWYG terminals. The Control Selection jumper must be in T'STAT position. During a call the remote thermostat will pass R back to the controller on a respective terminal. The push buttons on the touchpad become inactive in the remote thermostat mode. EXCEPT in T'STAT mode, the fan speed can be changed at the Touchpad and the fan mode is dictated by the Remote t'stat. However, the control pad LED display will indicate the mode of operation, and the room temperature.

Note: *In terms of outputs, there are two types of thermostats: relay contacts and solid state. If you open the thermostat and don't see relays then it must be solid state. Manufacturers of solid state output thermostats include loading resistors on their installation kits. They are of 560 Ohm and 3W value. These resistors are meant to load thermostat solid state outputs in order for the output voltage to be either 0 or 24VAC, i.e. no floating voltage. These resistors are connected from W, Y, G to common (C), respectively.*

You can wire any type of 24Vac thermostat straight into the REMOTE T'STAT connector of PTAC control boards, 667997102, 667997203 and 667997303 (Basic, Premium and Auto-Changeover models) and the control boards will recognize the signals from them.

Wall mounted thermostats are available for the PDAE/PDHE unit in automatic or manual changeover styles. All include a fan switch for constant "on" operation or "automatic" for cycle operation with the compressor. When requested, all necessary relays and transformers are factory mounted and ready for attachment to field supplied low voltage wires. All thermostats are 24-volt type and have dual Fahrenheit and Celsius temperature setpoint scales.

NOTICE

When using existing thermostats by others;

There are two basic types of thermostats manufactured today; those with relay contacts, and those with solid-state triacs. If you open the thermostat and don't see relays then you can assume it to be solid state.

Manufacturers of solid state output thermostats include loading resistors on their installation kits. These are of low Ohm value, approximately 560 Ohm and 3W. The resistors are meant to load the thermostat outputs in order for the output voltage to be either 0 or 24VAC, i.e. no floating voltage. These resistors are connected from W, Y, G to common (C), respectively. Therefore, if you are using existing solid-state thermostats, you may have to add loading resistors for your PTAC controls to work properly. Daikin thermostats do not require this modification.

Non-Programmable Thermostat Specs

Manual Changeover One-Stage Heat and Cool or One-Stage Heat Pump

Daikin Part No. 910116771 (1-Pk, White with Wall Plate)

Simple to operate, single push button for one-stage heating and cooling, or single stage heat pump. Zone compatible and 4- or 5 wire compatible (terminal "C" is optional for non-heat pump systems). System "heat-off-cool" switch and fan "on-off" switch.

Specifications

Electrical Rating:

- 24 VAC (18 to 30 VAC)
- 1 amp maximum per terminal
- 3 amp maximum total load
- 30-minute power loss memory retention

Temperature Control Ranges:

- 45°F to 90°F, Accuracy: ± 1°F

System Configurations:

- 1 stage heat, 1 stage cool or single stage electric heat pump

Terminations:

- R, C, W, Y, O, B, G

Wall-Mounted, 7, 5-2 & 5-1-1 ProgrammableThermostat Specs

Manual Changeover One-Stage Heat and Cool or One-Stage Heat Pump

Daikin Part No. 910116772 (1-Pk, White with Wall Plate)

Specifications

Electrical Rating:

- 24 VAC (18 to 30 VAC)
- 1 amp maximum per terminal
- 3 amp maximum total load
- 30-minute power loss memory retention
- Easy access terminal block

Temperature Control Ranges:

- 45°F to 90°F, Accuracy: ± 1°F

System Configurations:

- 1 stage heat, 1 stage cool or single stage electric heat pump

Terminations:

- RC, RH, C, W, Y, O, B, G

Standard Auto or Manual-Changeover Two-Stage Heat/ Two-Stage Cool Specs

Daikin Part No. 910116774 (1-Pk, White with Wall Plate)

Specifications

Electrical Rating:

- 24 VAC (18 to 30 VAC)
- 1 amp maximum per terminal
- 4 amp maximum total load
- 30-minute power loss memory retention
- Easy access terminal block

Temperature Control Ranges:

- 45°F to 90°F, Accuracy: ± 1°F

System Configurations:

- Single or two-stage heat/cool
- Single or two-stage heat pump

Terminations:

- R, C, W1/O/B, Y1, W2, Y2, G

Optional Remote Sensor

Part No. 667720401 (Used in Conjunction with Thermostat Part No. 910116774 Only)

The Fast, Easy Solution For Temperature Sensing Problems.

- For tamper prone areas
- Poor airflow areas
- Troubled applications
- Foam gasket prevents drafts through wall opening
- Mounts to standard 2" × 4" outlet box
- $2^{3}/_{4}$"W × $4^{1}/_{2}$"H

Wireless Remote Control (Optional)

The remote consists of 10 push-buttons

- **Power:**

  Functions the same as the ON/OFF button on the touchpad.
- **Sleep:**

  Functions the same as the SLEEP button on the touchpad.

Mode buttons

- **Heat, Cool, Cool/Dry, Fan:**

  Performs the same function as the MODE button on the touchpad and allows user to select the specific mode of operation using only one button.
- **Temp buttons ▲ +, ▼ – :**

  Functions same as the buttons on the touchpad and allows the user to change the setpoint.
- **Fan speed buttons (high & low):**

  Performs same function as the FAN SPEED button on the touchpad and allows user to select the specific speed using only one button.

Notes: *The remote must be aimed in a line of sight of the window in the upper right corner on the front panel, at less than a 45° angle from center of the window.*

T9000 Wireless Temperature Control

The T9000 Wireless Temperature Control is designed to provide precision temperature control without the installation labor and expense of wiring.

- Powered by AA batteries
- Mounts in any suitable location that will provide good temperature control.
- Large LCD display provides the user with current room temperature, set point temperature, time, program interval, and other system status information.

Programmable

Non-Programmable

Remote Control Node (RCN)

Used with the Wireless Temperature Control, the RCN interfaces with specific HVAC equipment, and communicates with its thermostat using unlicensed 900 MHz, radio frequency energy. Contact your local Daikin Representative for details.

Remote Mounted Thermostat Control

Considerations

The Remote Thermostat can be any thermostat that can interface with an electronic thermostat via RCWYBG terminals. The Control Selection jumper must be in T'STAT position. During a call the remote thermostat will pass R back to the controller on a respective terminal. The push buttons on the touchpad become inactive in the remote thermostat mode, EXCEPT in T'STAT mode, the fan speed can be changed at the Touchpad and the fan mode is dictated by the Remote t'stat. However, the control pad LED display will indicate the mode of operation, and the room temperature.

Units that are furnished with remote mounted thermostats should be wired as shown in Figure 33. Other considerations for this arrangement are as follows:

1. When wiring the low voltage plug and receptacle disconnect, provide enough wire to move harness out of the way for chassis removal.
2. If subbase is used, a small hole must be drilled and grommeted in the subbase front to allow passage of the low voltage wires.
3. When using a programmable wall thermostat, connect it to the terminal board remote thermostat plug. Refer to the instructions furnished with the chosen thermostat.

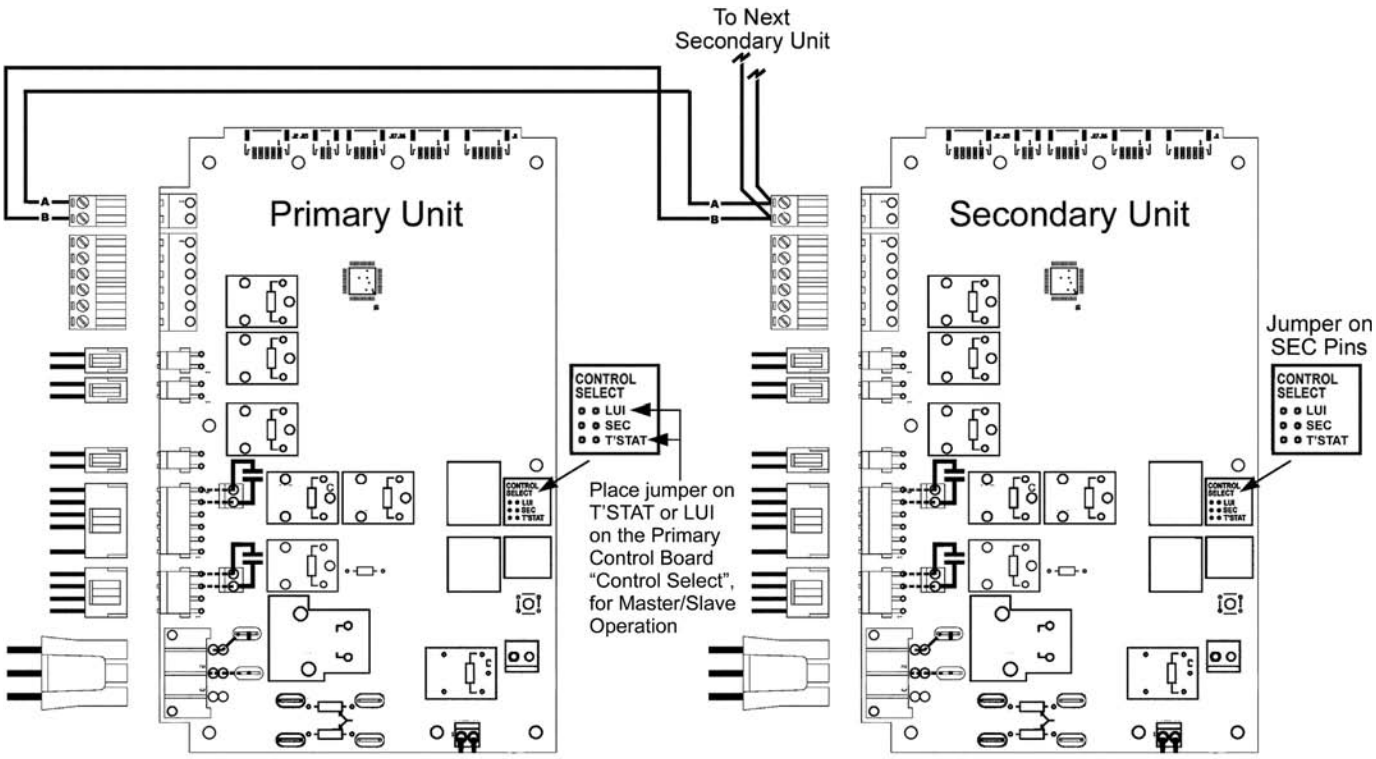
Note: *To allow Primary (Master) / Secondary (Slave) operation, the primary board thermostat jumper must be in the "T'STAT" position and the secondary boards must be in the "SEC" position.*

If secondary units are to be employed, see wiring connections in Figure 33.

The number of secondary units that can be connected is limited to 32 units.

Figure 33: Control Wiring to Allow Primary (Master)

Secondary (Slave) Unit Connection



Note: *Connect the Remote Thermostat only to the Master Unit.*

Premium (Programmable) Digital Control Board – Jumper Placement

1– Jumper Placement to Select System Module (See Jumper Detail)

A– Place jumper across AC/HYD to select Air Conditioner/Hydronic Heat.

B– Place jumper across AC/E to select Air Conditioner/Electric Heat.

C– Place jumper across AC/HYD/E to select Air Conditioner/Hydronic/Electric.

D– Place jumper across HP to select Heat Pump

E– Place jumper across HP/E to select Heat Pump/Electric.

2– Jumper Placement to Select Fan Control:

A– When in Fan Cycle Mode, fan operates for 2 minutes. Place jumper across 10, 20, 30, or 1 HR to select fan cycle off minutes which will be overridden by the room temperature.

3– Jumper Placement to Select Controller Type:

A– Place jumper across LUI to select unit mounted touchpad (Local User Interface).

B– Place jumper across SLAVE to select SLAVE Control by a master unit.

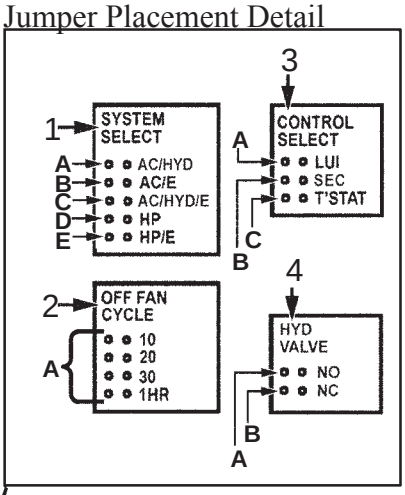
C– Place jumper across T'STAT to select remote, wall-mounted programmable, or non-programmable thermostat.

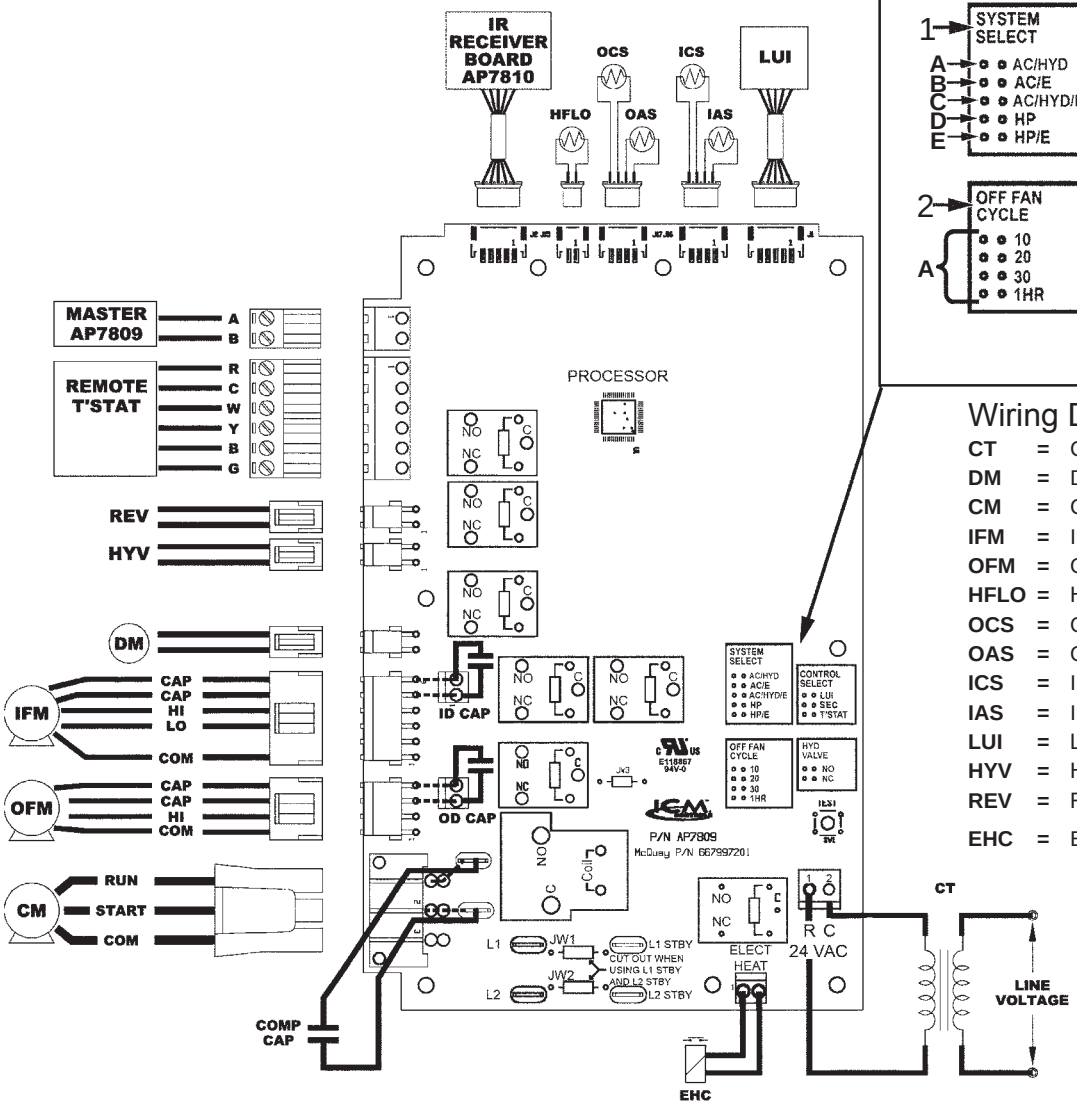
4– Jumper Placement to Select Hydronic Valve:

A– Place jumper across NO to select Normally Open Hydronic Valve.

B– Place jumper across NC to select Normally Closed Hydronic Valve.

Jumper Placement Detail





Wiring Diagram Legend

CT	=	Control Transformer
DM	=	Damper Motor
CM	=	Compressor Motor
IFM	=	Indoor Fan Motor
OFM	=	Outdoor Fan Motor
HFLO	=	Heat Fan Lockout Sensor
OCS	=	Outdoor Coil Sensor
OAS	=	Outdoor Air Sensor
ICS	=	Indoor Coil Sensor
IAS	=	Indoor Air Sensor
LUI	=	Local User Interface
HYV	=	Hydronic Valve
REV	=	Reversing Valve
EHC	=	Electric Heat Contactor

Standard (Non-Programmable) Digital Control Board – Jumper Placement

1– Jumper Placement to Select System Module (See Jumper Detail)

A– Place jumper across AC/E to select Air Conditioner with Electric Heat.

B– Place jumper across HP to select Heat Pump

C– Place jumper across HP/E to select Heat Pump with Electric Back-up Heat.

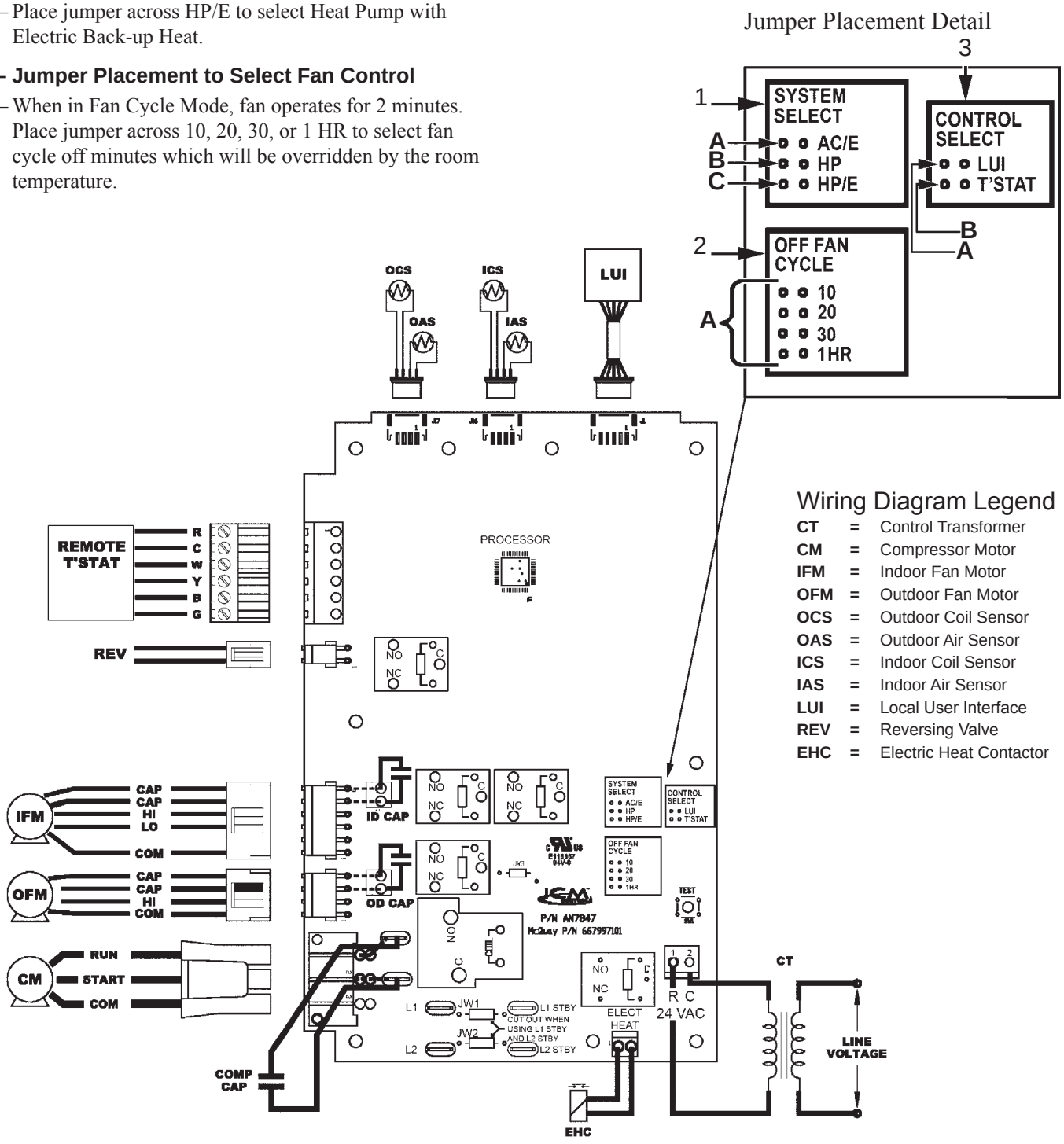
2– Jumper Placement to Select Fan Control

A– When in Fan Cycle Mode, fan operates for 2 minutes. Place jumper across 10, 20, 30, or 1 HR to select fan cycle off minutes which will be overridden by the room temperature.

3– Jumper Placement to Select Controller Type:

A– Place jumper across LUI to select unit mounted touchpad (Local User Interface).

B– Place jumper across T'STAT to select remote, wall mounted programmable, or non- programmable thermostat.



Wiring Diagram Legend

CT	=	Control Transformer
CM	=	Compressor Motor
IFM	=	Indoor Fan Motor
OFM	=	Outdoor Fan Motor
OCS	=	Outdoor Coil Sensor
OAS	=	Outdoor Air Sensor
ICS	=	Indoor Coil Sensor
IAS	=	Indoor Air Sensor
LUI	=	Local User Interface
REV	=	Reversing Valve
EHC	=	Electric Heat Contactor

Digital Control Board with Standby Power – Wiring Diagram

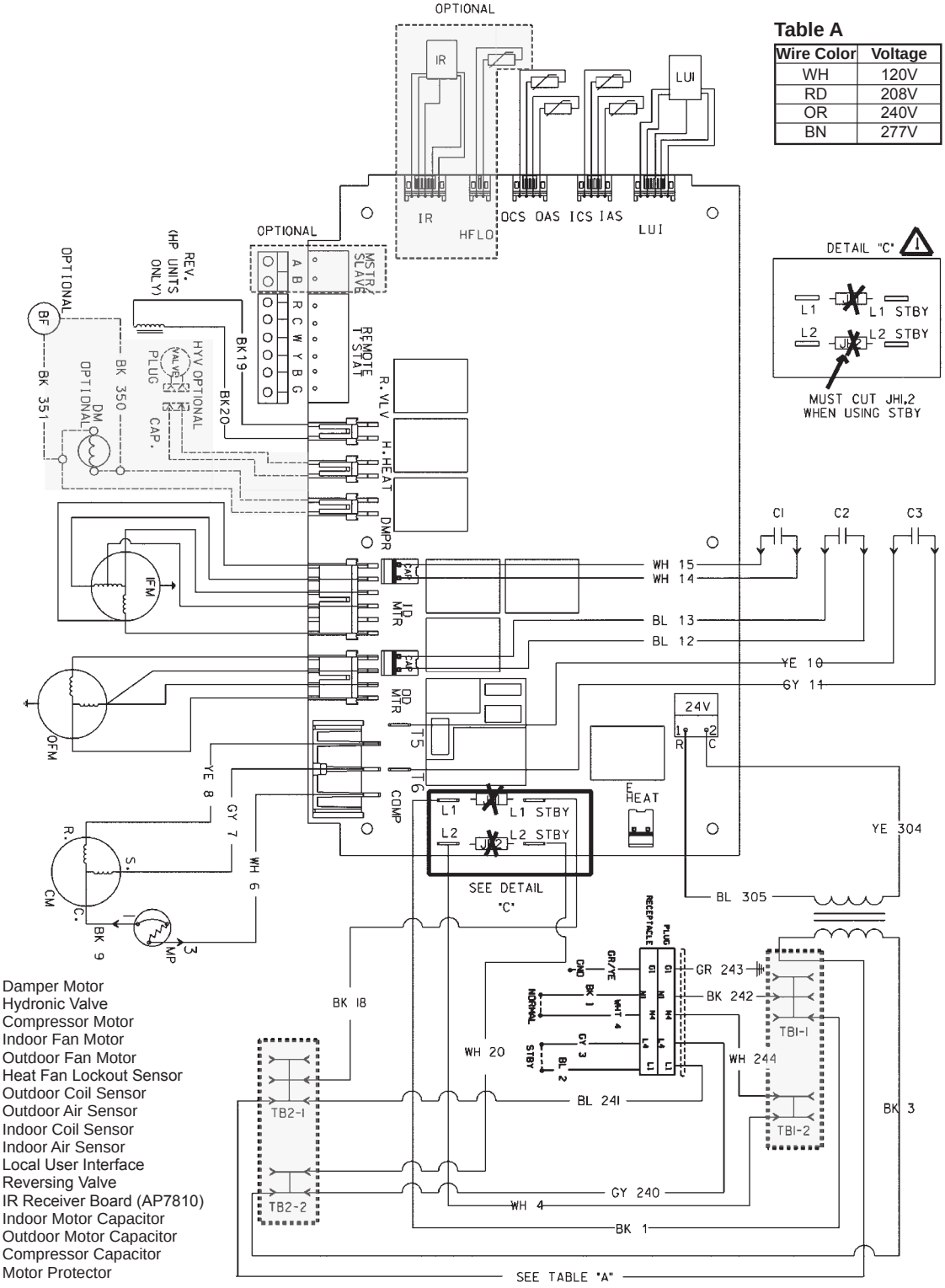
The standby power connections, L1 STBY and L2 STBY are meant to run the indoor motor at a separate voltage from the other motors, compressor and outdoor motor. When used as such, the jumpers, JH1 and JH2, must be cut. This renders L1 & L2 and L1 STBY and L2 STBY isolated from each other.

If there is no need to run the motors at a separate voltage the L1 = L1 STBY and L2 = L2 STBY. Therefore one voltage is used to run all motors.

If the jumpers are accidentally cut, then the connections can be spliced to substitute for the missing jumpers.

Table A

Wire Color	Voltage
WH	120V
RD	208V
OR	240V
BN	277V



Legend

DM	=	Damper Motor
HYV	=	Hydronic Valve
CM	=	Compressor Motor
IFM	=	Indoor Fan Motor
OFM	=	Outdoor Fan Motor
HFLO	=	Heat Fan Lockout Sensor
OCS	=	Outdoor Coil Sensor
OAS	=	Outdoor Air Sensor
ICS	=	Indoor Coil Sensor
IAS	=	Indoor Air Sensor
LUI	=	Local User Interface
REV	=	Reversing Valve
IR	=	IR Receiver Board (AP7810)
C1	=	Indoor Motor Capacitor
C2	=	Outdoor Motor Capacitor
C3	=	Compressor Capacitor
MP	=	Motor Protector

Note: *The gray tinted areas in the wiring diagram; are options available only with the premium control board.*
For the latest drawing version refer to the wiring diagram located on the inside of the controls access panel of the unit.

Digital Control Board without Standby Power – Wiring Diagram

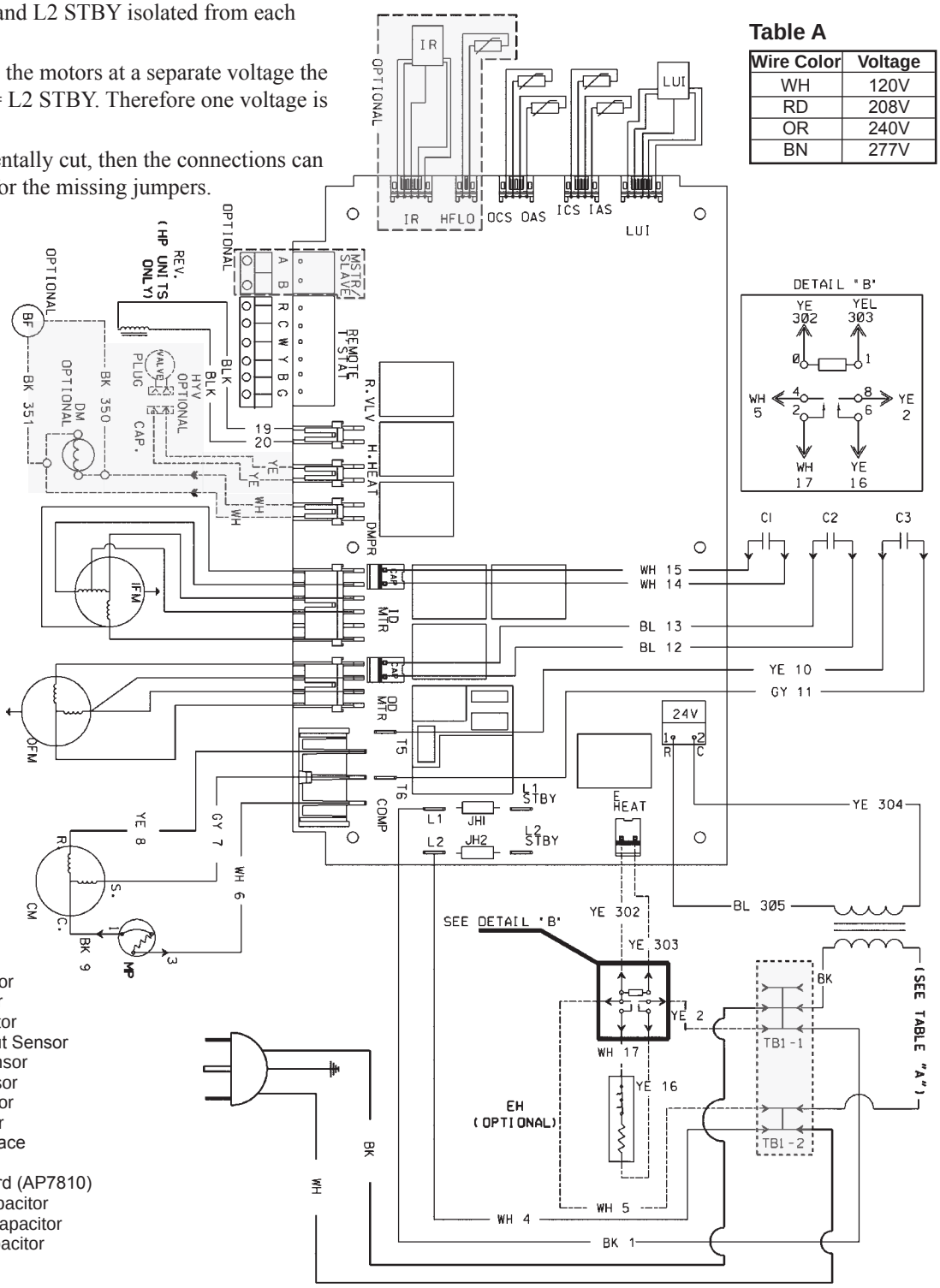
The standby power connections, L1 STBY and L2 STBY are meant to run the indoormotor at a separate voltage from the other motors, compressor and outdoor motor. When used as such, the jumpers, JH1 and JH2, must be cut. This renders L1 & L2 and L1 STBY and L2 STBY isolated from each other.

If there is no need to run the motors at a separate voltage the L1 = L1 STBY and L2 = L2 STBY. Therefore one voltage is used to run all motors.

If the jumpers are accidentally cut, then the connections can be spliced to substitute for the missing jumpers.

Table A

Wire Color	Voltage
WH	120V
RD	208V
OR	240V
BN	277V



Legend

DM	=	Damper Motor
HYV	=	Hydronic Valve
CM	=	Compressor Motor
IFM	=	Indoor Fan Motor
OFM	=	Outdoor Fan Motor
HFLO	=	Heat Fan Lockout Sensor
OCS	=	Outdoor Coil Sensor
OAS	=	Outdoor Air Sensor
ICS	=	Indoor Coil Sensor
IAS	=	Indoor Air Sensor
LUI	=	Local User Interface
REV	=	Reversing Valve
IR	=	IR Receiver Board (AP7810)
C1	=	Indoor Motor Capacitor
C2	=	Outdoor Motor Capacitor
C3	=	Compressor Capacitor
MP	=	Motor Protector

Note: *The gray tinted areas in the wiring diagram; are options available only with the premium control board. For the latest drawing version refer to the wiring diagram located on the inside of the controls access panel of the unit.*

Maintenance (Scheduled)

Incremental conditioners are built to last. With proper care, the unit should provide uninterrupted service for many years. Scheduled maintenance of this equipment as described below, is the key to the equipment's longevity.

A. Air filters must be cleaned at regular intervals. Twice annually may be adequate in some areas while twice monthly may be required in others. Areas with high dirt and lint content or heavy usage of units require more frequent filter maintenance than those areas of relatively clean operating or low usage conditions. Unit malfunction will occur if air filters are not kept clean. Rinse filter with hot water and a mild detergent.

B. Daikin recommends that every year the chassis be removed for a thorough checkup. This should be completed as follows:

1. Unplug unit from power source.
2. Remove front panel.
3. Remove chassis from cabinet and move it to the maintenance department. Replace with spare chassis or weather plate.
4. Check all seals and insulation and repair as required.
5. Check all wiring and controls for hazardous conditions.
6. Thoroughly clean discharge grilles.
7. Cover motors and control module with water tight material and wash evaporator coil, condenser coil and base pan using hot water and a mild soap.

Residential and institutional cleaning compounds can cause permanent damage to the packaged terminal unit. To avoid damage to unit controls and heat transfer surfaces, do not spray cleaning compounds onto the discharge grille, return air opening, or unit controls. Normal cleaning can be accomplished by wiping the unit surface with a damp cloth. When using cleaning compounds on carpets, floors or walls, turn the unit off to avoid drawing potentially damaging vapors into the package terminal unit.

8. Check condensate removal system and assure proper operation. Pour at least two (2) cups of water into evaporator drain pan and verify proper operation. Clean condensate drain and clear weep holes located at the bottom rear of wall sleeve.
9. Dry equipment thoroughly, especially electric parts and installation.
10. Clean any rust spots with steel wool and paint with rust inhibiting paint.
11. Clean insulation or replace if necessary.
12. Check insulation on refrigeration piping and replace if necessary.
13. Check all fasteners and tighten as required.
14. Clean and oil damper door and linkage.
15. Test run chassis before reinstalling.

Equipment Protection from the Environment

The metal parts of this unit may be subject to rust or deterioration in adverse environmental conditions. This oxidation could shorten the equipment's useful life. Salt spray, fog or mist in seacoast areas, sulphur or chlorine from lawn watering systems, and various chemical contaminants from industries such as paper mills and petroleum refineries are especially corrosive.

If the unit is to be installed in an area where contaminants are likely to be a problem, special attention should be given to the equipment location and exposure.

1. Avoid having lawn sprinkler heads spray directly in or on the outdoor louver.
2. In coastal areas, the units must have the corrosion protection package to maintain the warranty coverage.

Regular maintenance will reduce the buildup of contaminants and help to protect the outdoor section of the unit.

1. Frequent washing of the outdoor section, condenser fan blade and condenser coil with fresh water will remove most of the salt or other contaminants that build up in the outdoor section of the unit
2. Regular cleaning of the cabinet with a good non-abrasive polish will provide protection and keep it in good condition.
3. A mild liquid cleaner may be used several times a year to remove matter that will not wash off with water.

The best protection is frequent cleaning, maintenance and minimal exposure to contaminant.

Recommended Spare Parts

An inherent advantage of the Incremental system is that failure of any part affects only one incremental conditioner and does not interrupt the operation of the rest of the system. A further advantage is that a failed part can be quickly and easily replaced, thus minimizing the inoperative time of the equipment. This is so, however, only if a replacement part is quickly available. In order to replace a failed part quickly and keep all incremental conditioners in good operating condition, Daikin recommends that at the time incremental conditioners are purchased, owners arrange for a small stock of replacement parts.

Where an owner carries such a stock, immediate replacement of defective parts is possible. The defective part can then be returned to Daikin warranty parts. As long as it is still in warranty, it is repaired or replaced and returned to the owner with out cost for shop labor and material. Thus, the stock of replacement parts is constantly replenished. Below is a list of the kinds of parts which Daikin recommends to be carried in stock together with the quantity of parts recommended per 100 incremental conditioners installed.

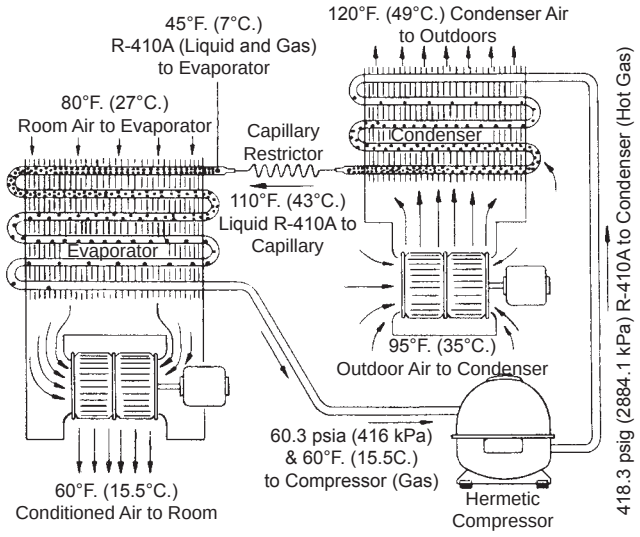
- Cooling Chassis 2
- Compressor Overload Device 2
- Compressor Running Capacitor 2
- Fan Motor. Capacitor 2
- Control Board 2
- Thermostat 2
- Control Relay (if used) 2
- Damper Motor (if auto damper) 2
- Electric Resistance Heater (if electric heat) 2
- Touch-up Paint (1 pt. spray can) 2

For the current spare parts list, and applicable prices, see your Daikin representative or write Daikin Service, P.O. Box 1551, Minneapolis, MN 55440.

Refrigeration Cycle

Every motor-driven refrigeration system operates on the carnot cycle. A practical understanding of what goes on at the various steps in this cycle can be a big help to the troubleshooting mechanic. Figure 34 illustrates the refrigeration cycle. The diagram shows what occurs in each component of a hermetically sealed system as used in all Daikin Air Conditioning equipment. The temperatures shown are typical of what they might be when the air entering the condenser (outdoor temperature) is 95°F, (350 C) and the temperature of the conditioned space is 80°F (270 C).

Figure 34: Refrigeration Cycle



Fault and Protection Codes for Applied PTAC/PTHP Control Board

Fault code	Description	Cause for the fault
CE	Communication Error	1. Cable not plugged in properly on either LUI or relay board. 2. Defective cable.
Sh	Missing Shunt	The user configurable shunt for System Select, Control Select Off Fan Cycle, and/or Hydronic Valve is missing or not placed properly.
E1	Problem with IAS	Indoor Air Sensor missing or short.
E2	Problem with ICS	Indoor Coil Sensor missing or short.
E3	Problem with OCS	Outdoor Coil Sensor missing or short.
E4	Problem with OAS	Outdoor Air Sensor missing or short.
E5	Problem with HFLO Sensor	HFLO Sensor missing or short on control board or heating medium >250ºF. Check for installation / connection of HFLO sensor. Should be on coil return line.
Protection code	**Description**	**Cause for the fault**
CF	Coil Freeze Protection	Indoor coil temperature has been below 32ºF for 5 minutes. Protection feature and the displayed code are dismissed when indoor coil temperature rises above 49ºF.
Rf	Room Freeze Protection	Indoor air temperature has dropped below 41ºF. Protection feature and the displayed code are dismissed when indoor room temperature rises at and above 50ºF.
hI	High Room Temperature	Indoor air temperature is 5 degrees above maximum setpoint limit. Protection feature and the displayed code are dismissed when indoor coil temperature rises above 50ºF.
Lo	Low Room Temperature	Indoor air temperature is 5 degrees below minimum setpoint limit.
LA	Low Ambient Lockout	Outdoor air temperature is below 25ºF.

Solid State Digital Controls – Local User Interface Display Codes

Fault code	Description	Cause for the fault
AU	Auto Damper	Control setup indicator damper is in "automatic" mode.
Au	Auto HP/E	Control setup indicator heat pump electric is in automatic changeover mode (HP/E).
bo	Brown Out or Low Voltage	Brown Out - Control monitors input voltage to prevent relay chattering. When voltage drops below 17 VAC, outputs are disabled until voltage input increases to 20 VAC or greater.
bY	HP/E Bypass	Control setup indicator, electric heat is bypassed when OCS > 40˚.
CE	LUI Communication	Communication Error, connection between LUI and control board.
CL	Damper Closed	Control setup indicator damper is in "closed" mode.
CF	Coil Freeze Protection	Indoor coil is ≤ 32˚ for at least 5 minutes. Compressor and outdoor fan stop and indoor fan continues to run for active defrost. Protection feature and the displayed code are dismissed when indoor coil temperature rised above 49°F.
Hi	Temperature Limiting	Hi Room Room Temperature Display Indication ONLY - Indoor air temperature is 5° above Maximum set point. Displayed code is dismissed when IAS temperature is < 5° from Max set point as adjusted in the Set Up Mode.
LA	Low Ambient Lockout	Unit is in cooling mode and outdoor air < 25˚. Compressor will cut out.
	Slave Unit Set to be Controlled by a Master Unit	When slave unit jumper for Control Select is positioned over SEC, slave unit is set to be controlled by a Master control unit.
LC	Control Lockout – Lockout Mode	Displays for 5 seconds when any button is pushed when in the "lockout mode". To initiate, hold MODE button for 10 seconds.
Lo	Temperature Limiting	Low Room Room Temperature Display Indication ONLY - Indoor air temperature is < 5° below minimum set point. Displayed code is dismissed when IAS temperature is > 5° from Minimum set point as adjusted In the Set Up Mode.
nL	Control Lockout – Normal Control	Displays for 5 seconds to confirm normal mode of operation when control lock out turned off. Initiate by holding MODE button for 10 sec.
rF	Room Freeze Protection	Room temperature < 41˚. Damper closes (Premium board) and unit goes into heat mode.
Sh	Jumper Status	Missing Shunt or not properly installed.
E1	Indoor Air Sensor	Indoor Air Thermister Failure. Sensor missing or Short.
E2	Indoor Coil Sensor	Indoor Coil Thermister Failure. Sensor missing or Short.
E3	Outdoor Coil Sensor	Outdoor Coil Thermister Failure. Sensor missing or Short.
E4	Outdoor Air Sensor	Outdoor Air Thermister Failure. Sensor missing or Short.
E5	Heat Fan Lock Out Sensor	Heat Fan Lock Out Sensor Failure, missing, short on control board or heating medium >250°F. Check for installation/connection of HFLO sensor. Should be on coil return line.

Troubleshooting

These items should be checked by a qualified service technician only.

Trouble	Cause	Cure
1. Blowers won't operate on cool	a. No power	a. Check supply line fusses, circuit breakers, and be sure the power is on. Blown fuses would indicate circuit overloading, a short circuit, or a ground condition in the circuit Voltage supply to the equipment should be checked. Voltage underload must be within 10% of voltage given on date plate.
	b. Faulty touchpad/thermostat.	b. Replace.
	c. Loose connections at push-button switch.	c Tighten.
2. Blowers operate on cool but compressor does not start	a. Thermostat set too high.	a. Adjust Rotate control knob to "Cooler."
	b. Heat valve is open and heat is on.	b. Close heat valve.
	c. Low voltage.	c. Check as above.
	d. Faulty touchpad/thermostat.	d. Replace.
	e. Faulty connection at touchpad/thermostat	e. Tighten.
	f. Defective wiring to thermostat.	f. Replace.
	g. Loose connections at compressor terminals.	g. Tighten.
	h. Wiring to compressor terminals defective.	h. Replace.
	i. Loose connections in compressor overload device.	i. Tighten.
	j. Starting capacitor malfunctions (open circuited, short circuited or loss of capacity).	j. Replace.
	k. Defective compressor motor (short circuited, open circuited, grounded).	k. * Ship cooling chassis prepaid to nearest Daikin authorized warranty station.
3. Blowers run on cool and compressor starts but stops after a short interval.	a. Operation of overload device due to overloading compressor motor.	a. Check voltage supply. Clean condenser inside and out. Check at outside face of condenser for recirculation of condenser air. Put air "splitters" in, if missing. Check compressor for short circuit. If defective, ship cooling chassis to nearest McOuay authorized warranty station.
4. Blowers run on cool and compressor starts and runs, but compressor occasionally stops (on overload device).	a. Low voltage due to overload circuits within building or throughout the local power system. Due to varying power demands, this condition might exist only at certain times during the day or on very hot days.	a. Run separate electric line to equipment Consult local power company.
	b. High voltage due to fluctuations in local power system; usually occurs during low load periods of the day	b. Consult local power company.
	c. Partial short circuit in compressor motor. Under normal loading a compressor with a partial short circuit might appear to be operating all right; increased condensing air temperature might then cause a short.	c. If confirmed, ship cooling chassis prepaid to nearest McOuay authorized warranty station.
5. Compressor starts and runs on cool but blowers do not run.	a. Faulty touchpad/thermostat.	a. Replace.
	b. Open circuited blower motor.	b. Replace.
	c. Blower rubbing against its housing.	c. Adjust blower motor or blower wheel position.
	d. Bearings on blower motor seized.	d. Replace motor
	e. Loose connection at touchpad/thermostat.	e. Tighten.
6. Compressor starts and runs on cool, but fan motor starts, then stops.	a. Operation of the internally connected overload device due to a short circuit in blower motor.	a. Replace motor
	b. Windings, rubbing of blower wheel or lack of lubrication in blower motor bearings.	b. Adjust blower wheel or motor, or replace.
7. Equipment gives electrical shock.	a. Grounded electrical circuit.	a. Eliminate ground.
8. Insufficient cooling capacity.	a. Equipment standing too long without being run.	a. If the air conditioner is allowed to stand for an extended length of time without being run on cool, it is possible for all the refrigerant to become absorbed in the oil inside the compressor and refrigeration circuit. If this should happen there will be no cooling until the necessary working pressures have been established. This will take about 5 minutes of continuous running.
	b. Insufficient airflow through condenser due to: 1) Dirty condenser. 2) 0bstructed louver on outer cabinet or wall box. 3) Condenser blower/fan not running. 4) Condenser blower/fan not up to speed. 5) Condenser blower/fan slipping on motor shaft. 6) Recirculation of condenser air.	b. 1) Clean. 2) Remove obstructions. 3) Check same as in the case of malfunctioning condenser air blower. 4) Check for correct voltage. Replace blower motor if necessary 5) Adjust blower position and tighten setscrews. 6) Correct as in No 3 above.
	c. Insufficient airflow through evaporator due to: 1) Dirty evaporator. 2) Ice on evaporator coils. 3) Dirty air filter. 4) Obstructed discharge grilles. 5) Evaporator blower motor not running. 6) Evaporator blower motor not up to speed. 7) Evaporator motor slipping on motor shaft.	c. 1) Clean. 2) Turn equipment off to let ice melt (see last two items of No. 9 "Too much cooling," on page 44. 3) Clean or replace. 4) Remove obstructions. 5) Check as in No. 1. 6) Check for correct voltage. Replace motor if necessary. 7) Adjust blower wheel position and tighten setscrew
	d. Heat load in room exceeds capacity of equipment.	d. Refer to original load calculations, recalculate heat load.
	e. Windows and doors in room are open	e. Close them.
	f. Compressor not pumping, indicated by: 1) Low wattage. 2) Condenser not warm, evaporator only partially cool or not at all .	f. * Ship prepaid to nearest Daikin warranty station.
	g. Restricted capillary or strainer. 1) Frost on capillary or strainer 2) Low wattage. 3) Condenser not warm. 4) Evaporator partially frosted, only partially cool or not at all.	g. * Ship prepaid to nearest McOuay warranty station.

Trouble	Cause	Cure
9. Too much cooling.	a. Thermostat set too low. b. Defective thermostat	a. Adjust. b. Replace.
10. “Sweating.”	a. Condensate drain from evaporator to condenser plugged. b. Insulating seals on equipment damaged. c. Evaporator blower motor not up to speed. d. Evaporator blower incorrectly positioned.	a. Remove obstructions to water flow. b. Adjust or replace. c. Check for correct voltage. Replace motor if necessary. d. Tighten.
11. Blowers won’t operate on Heat.	a. No power. b. Check HFLO installation/correction c. Heat is off (equipment with heat fan lock out. d. Faulty touchpad/thermostat e. Loose connections at touchpad/thermostat f. Thermostat set too low.	a. See No. 1. b. Open heat valve or turn on heating system. c. Replace. d. Tighten. e. Adjust. Rotate control knob to “warmer”.
12. Equipment is noisy.	a. Blower rubbing against enclosure. b. Blower motor bearings dry. c. Loose blower hold-down nuts on motor-bracket assembly d. Refrigerant absorbed in compressor oil after extended shutdown. e. Equipment improperly installed. f. Damper solenoid hums. g. Loose terminal box cover on side of compressor. h. Loose electrical components. i. Copper tubing vibrating. j. Harmonics.	a. Adjust fan position on motor shaft or reposition fan motor bracket assembly. b. Replace motor. c. Align blower assembly and tighten nuts. d. Noise will disappear after equipment runs awhile. e. Make necessary adjustments to components. f. Check for proper adjustment. Apply silicone oil or grease to gap between solenoid and armature. g. Tighten. h. Fasten securely. i. Occasionally equipment will have noise for no apparent reason. Inspection has revealed no loose components that might be the source of the noise. Due to the action of the compressor, it is possible to have internal noise develop if the refrigerant tubing has become bent even slightly. To distinguish this condition from the simple rattle producing vibration caused by loose screws, nuts and other components, grasp the refrigerant tubing at various points throughout the system until a point is found where the noise is eliminated or reduced. Bend the copper tubing very gently until the noise disappears. j. Tighten.
13. Insufficient or no heat.	a. No steam or hot water being applied. b. No power. c. Faulty touchpad/thermostat. d. Loose connection at touchpad/thermostat. e. Thermostat set too high. f. Thermostat faulty. g. No power output on transformer secondary. h. Inoperative valve. 1) Steam valve N/C. 2) Hot water valve N/C.	a. Contact building management. b. Check power supply line fuse, circuit breakers. Blown fuses would indicate circuit overloading, a short circuit, or a grounded condition in the circuit. c. Replace. d. Replace wire or tighten. e. Adjust. Rotate knob to “warm”. f. Replace. g. Replace. h. 1) Temporarily lock valve open; replace. 2) Replace.

Notes:

This guide was prepared with standard equipment in mind. If equipment is special, it may not be entirely applicable.

* *If equipment is still in warranty.*

** ***Notice:*** *Before trying to correct the noise, determine its cause: conditioned air blower, compressor or condenser blower. Operate the conditioned air blowers only. If this doesn’t cause the noise, operate on cooling. Then disconnect one compressor lead. If the noise stops, the compressor is the source, If not, it is caused by the condenser blower.*

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